Vol. 1071 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

oute to:

PATENTS

October 21, 1986

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

October 21, 1986 Volume 1071 Number 3

CONTENTS

		Page
Patent and Trademark Office Notices		
Patent Cooperation Treaty (PCT) Information	1039 OG	22
Patent Cooperation Treaty (PCT) Update	1071 OG	22
Notice of Maintenance Fees Payable	1071 OG	22
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1071 OG	23
Reissue Applications Filed	1071 OG	23
Requests for Reexaminations Filed	1071 OG	24
Erratum	1071 OG	24
Registration to Practice	1071 OG	24
Arbitration of Patent Interference Cases	1071 OG	25
Revision of the Scope of the Secrecy Order for Defense Agency Use	1071 OG	31
Patent Certificates of Correction	1071 OG	35
Disclaimers	1071 OG	35
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1071 OG	36
Condition of Patent Applications	1071 OG	37
Reissue Patents Granted (32,266)		935
Plant Patents Granted (5,791)		937
Patents Granted		
General and Mechanical (4,617,684)		939
Chemical (4,618,343)		1177
Electrical (4,618,739)		1287
Design Patents Granted (286,220)		1379
Index of Patentees		PI 1
Indices of Reissue, Design and Plant Patentees		PI 51
Classification of		
Patents (Including Reissues)		PI 55
Designs and Plant Applications		PI 58
Geographical Index of Residence of Inventors		
Patents (Including Reissues)		PI 59
Designs and Plant Applications		PI 60
Change of Address Form and Subscription Order Form		Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before Nov. 1, 1986	930.00
if paid on or after Nov. 1, 1986	1015.00
International fees	
Basic fee (first 30 pages):	
if paid before Nov. 1, 1986	375.00
if paid on or after Nov. 1, 1986	430.00
Basic Supplemental fee (for each page over 30):	
if paid before Nov. 1, 1986	7.00
if paid on or after Nov. 1, 1986	8.00
Designation fee for the first 10 national or regional offices:	
if paid before Nov. 1, 1986	90.00
if paid on or after Nov. 1, 1986	105.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Sept. 30, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Patent Cooperation Treaty (PCT) Update

Change in International fees effective Nov. 1, 1986.

The International Bureau of the World Intellectual Property Organization has informed the U.S. Patent and Trademark Office that, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss Franc and the German Mark, the dollar amount of the International Fees for PCT applications filed in the United States Receiving Office and for having an international search report prepared by the European Patent Office will increase effective Nov. 1, 1986.

Effective Nov. 1, 1986 the amount of the International Fees for PCT applications filed in the United States Receiving Office will be:

Basic Fee (first 30 pages)	$430.00
Basic Supplemental Fee (each page over 30)	8.00
Designation Fee (per country or region up to ten)	105.00
Designation Fee (for 11th and subsequent countries or regions)	No Charge

Effective Nov. 1, 1986 the amount of the search fee for an international application by the European Patent Office as an International Searching Authority will be $1015.

DONALD J. QUIGG,
Sept. 30, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Oct. 18, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,409,689 through 4,411,022
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years;

the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED AUGUST 3, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,342,155	06/257,663	8/3/82
4,342,161	06/241,814	8/3/82
4,342,171	06/266,278	8/3/82
4,342,202	06/247,236	8/3/82
4,342,224	06/253,459	8/3/82
4,342,295	06/246,390	8/3/82
4,342,296	06/246,400	8/3/82
4,342,297	06/246,656	8/3/82
4,342,311	06/248,483	8/3/82
4,342,312	06/248,868	8/3/82
4,342,389	06/235,908	8/3/82
4,342,410	06/241,446	8/3/82
4,342,416	06/225,308	8/3/82
4,342,553	06/306,824	8/3/82
4,342,582	06/300,313	8/3/82
4,342,591	06/258,306	8/3/82
4,342,611	06/226,501	8/3/82
4,342,614	06/240,210	8/3/82
4,342,624	06/290,763	8/3/82
4,342,627	06/254,740	8/3/82
4,342,632	06/259,873	8/3/82
4,342,660	06/272,946	8/3/82
4,342,661	06/269,811	8/3/82
4,342,688	06/244,910	8/3/82
4,342,696	06/277,176	8/3/82
4,342,710	06/243,421	8/3/82
4,342,714	06/249,430	8/3/82
4,342,734	06/284,848	8/3/82
4,342,754	06/242,711	8/3/82
4,342,838	06/242,638	8/3/82
4,342,867	06/245,412	8/3/82
4,343,000	06/251,617	8/3/82
4,343,019	06/225,772	8/3/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,208,462, Re. S.N. 903,305, Filed Sept. 3, 1986, Cl. 428/265, LAMINATED STRUCTURE COMPRISING A LAYER OF FLUORINATED PLYMER, Rene Dauphin, et al., Owner of Record: *Solvay and Cie, Brussels, Belgium,* Attorney or Agent: George H. Spencer, Ex. Gp.: 125

4,368,941, Re. S.N. 888,315, Filed July 22, 1986, Cl. 339/183, ELECTRICAL JACK FRAMES, Ronald G. Martin, Owner of Record: *ADC Telecommunications, Inc., Minneapolis, Minn.,* Attorney or Agent: Curtis G. Hamre, et al., Ex. Gp.: 322

4,467,219, Re. S.N. 898,312, Filed Aug. 20, 1986, Cl. 307/10R, VARIABLE TIME DELAY APPARATUS FOR CONTROLLING THE START OF A VEHICLE, Dennis Reid, Owner of Record: *Inventor,* Attorney or Agent: Karl A. Limbach, et al., Ex. Gp.: 216

4,468,105, Re. S.N. 900,322, Filed Aug. 25, 1986, Cl. 353/66, OPAQUE PROJECTOR, John R. Montgomery, Owner of Record: *Constanting Systems, Inc., Chicago, Ill.,* Attorney or Agent: James P. Hume, et al., Ex. Gp.: 246

4,468,359, Re. S.N. 900,618, Filed Aug. 26, 1986, Cl. 264/82, FOUNDRY MOULDS AND CORES, Deter H. R. B. Lemon, et al., Owner of Record: *Borden (UK) Ltd., Southampton, England,* Attorney or Agent: Frank E. Robbins, et al., Ex. Gp.: 151

4,500,083, Re. S.N. 898,359, Filed Aug. 20, 1986, Cl. 270/54, COLLATING AND BINDING SYSTEM AND METHOD WITH POSTAGE INDICATION, Did-Bun Wong, Owner of Record: *R. R. Donnelley and Sons Co., Chicago, Ill.,* Attorney or Agent: Bradford Wiles, et al., Ex. Gp.: 337

4,513,632, Re. S.N. 903,268, Filed Sept. 3, 1986, Cl. 74/484R, MOUNTING BRACKET FOR A STEERING COLUMN CONTROL STALK, Jack E. Swoveland, Owner of Record: *Dana Corp., Toledo, Ohio,* Attorney or Agent: Vincent L. Barker, et al., Ex. Gp.: 352

4,546,234, Re. S.N. 896,104, Filed Aug. 13, 1986, Cl. 219/137PS, OUTPUT CONTROL OF SHORT CIRCUIT WELDING POWER SOURCE, Takaaki Ogasawara, et al., Owner of Record: *Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan,* Attorney or Agent: Norman F. Oblon, et al., Ex. Gp.: 216

4,547,240, Re. S.N. 902,174, Filed Aug. 29, 1986, Cl. 156/85, METHOD OF PREFABRICATING AN ELECTRICAL CONNECTOR, James A. Zilligen, et al., Owner of Record: *FTZ Industries, Inc., Simpsonville, S.C.,* Attorney or Agent: John B. Hardaway, III., et al., Ex. Gp.: 138

4,569,780, Re. S.N. 901,240, Filed Aug. 27, 1986, Cl. 252/90, CAST DETERGENT-CONTAINING ARTICLE AND METHOD OF MAKING AND USING,

Peter J. Fernholz, et al., Owner of Record: *Economics Laboratory, Inc., St. Paul, Minn.*, Attorney or Agent: John D. Gould, et al., Ex. Gp.: 157

4,569,781, Re. S.N. 901,250, Filed Aug. 27, 1986, Cl. 252/92, CAST DETERGENT-CONTAINING ARTICLE AND METHOD OF USING, Peter J. Fernholz, et al., Owner of Record: *Economics Laboratory, Inc., St. Paul, Minn.*, Attorney or Agent: John D. Gould, et al., Ex. Gp.: 157

4,580,320, Re. S.N. 897,173, Filed Aug. 15, 1986, Cl. 24/113, BUTTON HAVING PLASTIC RESIN HEAD, Akihiko Takata, Owner of Record: *Scovill Japan Kubushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Ronald L. Panitch, et al., Ex. Gp.: 357

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,520,747, Reexam. No. 90/001,082, Requested: Sept. 5, 1986, Cl. 156/153, METHOD OF MAKING STRUCTURAL MEMBERS OF LAYERS OF CORROSION RESISTANT COATING AND FIBROUS MATERIAL, Robert S. McGaughey, Owner of Record: *McCreary Tire & Rubber Co., Indiana, Pa.*, Attorney or Agent: Buell, Ziesenheim, et al., Ex. Gp.: 130, Requester: SW Industries, Inc., Providence, R.I.

3,846,710, Reexam. No. 90/001,080, Requested: Sept. 8, 1986, Cl. 330/11, DC RESTORATION AMPLIFIER WITH AUTOMATIC ZERO OFFSET ADJUSTMENT, Ronald H. Chapman, Owner of Record: *Motorola, Inc., Schaumberg, Ill.*, Attorney or Agent: Steven C. Parmelee, Ex. Gp.: 250, Requester: Owner

3,995,018, Reexam. No. 90/001,075, Requested: Aug. 27, 1986, Cl. 424/1.1, METHOD OF BINDING IMMUNOGLOBULIN EMPLOYING A POLYPEPTIDE FROM MICROORGANISMS, John Axel Sjoquist, Owner of Record: *Pharmacia Aktlebolag, Uppsala, Sweden,* Attorney or Agent: Fred Philpitt, Ex. Gp.: 120, Requester: Townsend & Townsend, San Francisco, Calif.

3,995,610, Reexam. No. 90/001,074, Requested: Aug. 25, 1986, Cl. 123/192, FOUR CYCLE STRAIGHT-TYPE ENGINE WITH SECONDARY BALANCER SYSTEMS, Malcom Moore, et al., Owner of Record: *Mitsubishi Jidosha Kogyo Kaisha, Tokyo, Japan,* Attorney or Agent: Sughrue, Mion, et al., Ex. Gp.: 340, Requester: DR Ing h.c.F., Porshe AG, Postfach 1140, Porschestrasse D, Weissach, Germany

4,048,654, Reexam. No. 90/001,081, Requested: Sept. 10, 1986, Cl. 358/144, STEREOPHONIC TELEVISION SOUND TRANSMISSION SYSTEM, Carl R. Wegner, Owner of Record: *Telesonics, Inc., Chicago, Ill.*, Attorney or Agent: Lockwood, Alex, et al., Ex. Gp.: 230, Requester: RCA Corp., Princeton, N.J.

4,062,141, Reexam. No. 90/001,077, Requested: Aug. 28, 1986, Cl. 43/3, DECOY, Jelmer B. Shjeflo, Owner of Record: *Jelmer Shjeflo, Bismark, N.D.*, Attorney or Agent: Robert E. Kleve, Ex. Gp.: 320, Requester: CBK, Ltd., Union City, Tenn.

4,138,543, Reexam. No. 90/001,079, Requested: Sept. 4, 1986, Cl. 528/14, POLYMERIZATION OF ORGANOPOLYSILOXANES, Michel Bargain, et al., Owner of Record: *Rhone-Poulenc Specialites Chemiques, Courbevoil, France,* Attorney or Agent: Bacon & Thomas, Ex. Gp.: 150, Requester: James V. Costigan, New York, N.Y.

4,457,847, Reexam. No. 90/001,084, Requested: Sept. 9, 1986, Cl. 210/698, CARBOXYLATE POLYMERS FOR INTERNAL SCALE CONTROL AGENTS IN BOILER SYSTEMS, Walter F. Lorenc, et al., Owner of Record: *Nalco Chemical Co., Naperville, Ill.*, Attorney or Agent: Willian, Brinks, et al., Ex. Gp.: 130, Requester: Owner

4,507,019, Reexam. No. 90/001,085, Requested: Sept. 11, 1986, Cl. 405/154, METHOD AND APPARATUS FOR REPLACING BURIED PIPE, Allen E. Thompson, Owner of Record: *Expand-A-Line, Inc., Pasadena, Tex.*, Attorney or Agent: Gunn, Lee, et al., Ex. Gp.: 350, Requester: Larson & Taylor, Arlington, Va.

4,532,947, Reexam. No. 90/001,076, Requested: Aug. 25, 1986, Cl. 131/331, FILTER FOR REDUCING THE TOXIC EFFECTS OF CIGARETTE TOBACCO SMOKE, Jane R. Caseley, Owner of Record: *Windleshaw Enterprises Ltd., East Sussex, England,* Attorney or Agent: John T. Miller, Ex. Gp.: 110, Requester: Owner

4,572,253, Reexam. No. 90/001,078, Requested: Sept. 3, 1986, Cl. 141/95, AUTOMATIC LEVEL SENSING SYSTEM, M. Zane & Diane Farmer, Owner of Record: *Inventors, Ashburnham, Mass.*, Attorney or Agent: Joseph S. Iandiorio, Ex. Gp.: 240, Requester: The Coca-Cola Co., Atlanta, Ga.

4,578,768, Reexam. No. 90/001,083, Requested: Sept. 5, 1986, Cl. 364/560, COMPUTER AIDED COORDINATE DIGITIZING SYSTEM, Marsh V. Racine, Owner of Record: *Inventor, San Diego, Calif.*, Attorney or Agent: Brown, Martin, et al., Ex. Gp.: 230, Requester: Owner

---

Erratum

"All reference to Patent No. 4,613,189 to William J. Barr of Gibson Island, Md., for VALVE ASSEMBLY FOR USE IN BRAKE PRESSURE CONTROL UNIT, appearing in the Official Gazette of Sept. 23, 1986, should be deleted since no patent was granted."

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before Nov. 21, 1986:

Asquith, Anthony, 1100 Commerce St. N., 50 Queen St., Kitchener, Canada N2H 6M1

Barlow, James E., 14509 Clark St., Crown Point, Ind. 46307

Bentley, Diane R., 590 Fulton Ave., #4A, Hempstead, N.Y. 11550

Black, Joseph R., Jr., 4640 Wendler Blvd., Gahanna, Ohio 43230

Bradley, Raymond H., 850 Regal, Houston, Tex. 77034
Carroll, John A., 7119 Vantage Dr., Alexandria, Va. 22306
Carson, James W., 133 Richmond St. W., Toronto, Ont., Canada M5H 2L7
Faraci, C. Joseph, 6100B Essex House Sq., Alexandria, Va. 22310
Foulke, Cynthia Lee, 4326 N. Pershing Dr., #3, Arlington, Va. 22203
Gerber, Joseph E., 925 Carro Dr., #3, Sacramento, Calif. 95825
Glastetter, Calvin E., 2322 Bainter La., Peoria, Ill. 61515
Graham, Mark S., 401 Gallaher View Rd., #424, Knoxville, Tenn. 37919
Hendricksen, Mark W., 4408 Woodruff Rd., Spokane, Wash. 99206
Hey, David A., 1400 S. Joyce St., #A1602, Arlington, Va. 22202
Johnson, Beverly K., 1836 Metzerott Rd., #708, Adelphi, Md. 20783
LaCava, Michael A., 46 E. Hillsdale Blvd., San Mateo, Calif. 94403
Lauro, Peter C., 182 Thunder Cir., Bensalem, Pa. 19020
Maag, Gregory L., 3426 Esterbrook, Houston, Tex. 77082
McGruder, David J., Suite 700, The National Bldg., 130 Slater St., Ottawa, Canada K1P 6E2
McKenna, Michael R., 1122 W. Morse, Chicago, Ill. 60626
McLain, Janice M., 5970 Lakebluff Dr., #102, Tinley Park, Ill. 60477
Morris, Terry B., 2808 Hunterwood Dr., S.E., Decatur, Ala. 35603
Napoli, James J., 2442 Brumley, Flossmoor, Ill. 60422
Neblett, Adonis A., 925 E. 8th Ave., #120, Denver, Colo. 90218
Nusbaum, Mark E., 8002 Treasure Tree Ct., Springfield, Va. 22153
Pearson, Louise S., 535 N. Michigan Ave., #32, Chicago, Ill. 60611
Prlina, Julie M., 4511 Normandy-2, Dallas, Tex. 75205
Roberts, Elbert L., 13103 Brittany Dr., Silver Spring, Md. 20904
Shaw, Dennis, 2228 Stockton Loop, Kirtland AFB, N. Mex. 87118
Sweeney, Charles V., 53282 Bonvale Dr., South Bend, Ind. 46635
Wong, Harry, Jr., 115 23rd Rd. S., Arlington, Va. 22202
Yaeger, Daniel A., 1391 Devils Back Bone Rd., Cincinnati, Ohio 45238

CAMERON WEIFFENBACH,
Sept. 24, 1986. *Director, Office of Enrollment and Discipline.*

Department of Commerce
Patent and Trademark Office
37 CFR Part 1
[Docket No. 50103-6060]

Arbitration of Patent Interference Cases

Agency: Patent and Trademark Office, Commerce.
Action: Notice of proposed rulemaking.
Summary: Section 105 of the Patent Law Amendments Act of 1984, Pub. L. 98-622, provides for arbitration of patent interference cases. In this document, the Patent and Trademark Office is publishing a proposed regulation to implement the arbitration provision.
Date: Comments and suggestions should be received by Nov. 14, 1986. No hearing will be held.
Address: Address written comments to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
For Further Information Contact: Ian A. Calvert or Michael Sofocleous by telephone at (703) 557-4000 or by mail marked to the attention of either and addressed to Box Interference, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Section 105 of the Patent Law Amendments Act of 1984, enacted on Nov. 8, 1984, provides for the arbitration of patent interference cases. Section 105, codified as 35 U.S.C. 135(d), provides:

> Parties to a patent interference, within such time as may be specified by the Commissioner by regulation, may determine such contest or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of title 9 to the extent such title is not inconsistent with this section. The parties shall give notice of any arbitration award to the Commissioner, and such award shall, as between the parties to the arbitration, be dispositive of the issues to which it relates. The arbitration award shall be unenforceable until such notice is given. Nothing in this subsection shall preclude the Commissioner from determining patentability of the invention involved in the interference.

The Patent and Trademark Office (PTO) conducts interference proceedings to determine any question of patentability and priority of invention between two or more parties claiming the same patentable invention. An interference may be declared between two or more pending applications naming different inventors when, in the opinion of an examiner, the applications contain claims for the same patentable invention. An interference may be declared between one or more pending applications and one or more unexpired patents naming different inventors when, in the opinion of an examiner, any application and any unexpired patent contain claims for the same patentable invention. Patent interference cases can be quite expensive. Arbitration may prove useful to minimize expenses in interference cases. The proposed arbitration rule, if adopted, would apply to all pending interferences.

The PTO published an advance notice of rulemaking in the **Federal Register** of Jan. 16, 1985. (50 FR 2294 through 2296). The notice was also published in the *Official Gazette* on Feb. 12, 1985. 1051 *Official Gazette* 9-10; 1051 TMOG 10-11. The notice also appeared in the Bureau of National Affairs' Patent, Trademark & Copyright Journal, Vol. 29, pp. 310 [Jan. 24, 1985], hereinafter "BNA." Five written comments were received in response to the advance notice. The comments are analyzed herein. The five comments are available for public inspection in Rm. 10C01, Crystal Gateway II, 1225 Jefferson Davis Hwy., Arlington, Va.

Guidelines for Arbitration

From the tenor of the comments, it is apparent that the commentors desire guidance from the PTO concerning its policy with respect to the arbitration of patentability issues and extensions of time for arbitration.

Under proposed §1.690 the arbitrator could determine issues of patentability as between the parties but a determination that the subject matter is patentable would not be binding upon the PTO. If the arbitrator's award holds that a party's claims corresponding to the count are unpatentable over prior art or under 35 U.S.C. 112, that determination would be binding on that party vis-a-vis the party's opponent and would result in a judgment adverse to that party. The judgment, however, would not discharge the duty that each party has under 37 CFR 1.56 to bring to the attention of the examiner in charge of its respective application any prior art and/or reason relied upon by the arbitrator in the determination of unpatentability.

It is the longstanding practice of the PTO to favor the settlement of interferences and the PTO looks with favor on all proper efforts in that direction as being conducive to the termination of the proceeding. See 4 Rivise and Caesar, *Interference Law and Practice*, section 861, pp. 2956 (Michie Co. 1948) and the Commissioner's Notice of Nov. 9, 1976, titled, "Extensions of Time

and Filing of Papers in Interferences," 953 *Official Gazette* 2 (Dec. 7, 1976). In this regard, the notice states that:

. . . stipulations or motions for extensions of time under 37 CFR 1.245 will not henceforth be approved or granted, respectively, unless accompanied by a detailed showing of facts sufficient to establish that the action for which the extension is sought could not have been or cannot be taken or completed during the time previously set therefor, and that the entire extension appears necessary for the taking or completion of that action. Since the Office favors the amicable settlement of interferences, the foregoing requirement will be liberally applied in the case of a first request for extension of time for the purpose of negotiating settlement.

Consequently, the examiner-in-chief could give favorable consideration to a motion for an extension of time for purposes of settlement; however, a further motion for an extension for that purpose would not be granted unless it is accompanied by a schedule of specific dates showing that the parties will make a good faith effort to promptly terminate the proceeding. If preliminary motions under 37 CFR 1.633 have not been filed, the examiner-in-chief would not normally extend the time for their filing merely for purposes of settlement. In these circumstances, the examiner-in-chief would require that the preliminary motions be filed or that their filing be waived.

If the proceeding is in the testimony stage, the examiner-in-chief could grant the parties' motion to extend all the unexpired testimony times to close concurrently on the date the record is due provided they file a stipulation that any evidence to be submitted will be in one of the forms specified in 37 CFR 1.672(e)and (f), i.e., affidavit testimony or a stipulation either as to what a particular witness would testify to if called or the facts in the case of any party.

Analogously, the aforesaid practice would apply to arbitration. Parties who intend to arbitrate an interference would be required to notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within 20 days of its execution. Pursuant to 35 U.S.C. 135(c) an agreement to arbitrate is considered to be one "made in connection with and in contemplation of the termination of the interference" and therefore would have to be in writing and a copy would have to be filed in the PTO. The notification would be made in a separate paper. Merely incorporating the notification in the settlement agreement under 35 U.S.C. 135(c) would not be sufficient to comply with proposed §1.690(a). The parties also would be required to adhere to a time schedule approved by the examiner-in-chief such that the interference proceeding can be expeditiously resolved so as to prevent the unnecessary postponement of the beginning of the running of the term of any patent resulting from an application involved in the interference. *Pritchard* v. *Loughlin*, 361 F.2d 483, 149 USPQ 841 (CCPA 1966).

If the parties desire to arbitrate an interference prior to the close of the motions period, the examiner-in-chief would not normally grant an extension of time for that purpose. The parties would be required to file their preliminary motions under 37 CFR 1.633. After the motions are filed, the examiner-in-chief could grant an extension only upon compliance with 37 CFR 1.645 which requires a showing of "good cause." Such a "good cause" showing would normally include a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

The arbitration agreement should include the following provisions:

(1) The name of the arbitrator or a date certain (not more than 30 days after the execution of the agreement) for his or her selection.

(2) The issues to be decided by the arbitrator.

(3) That the arbitrator's award is binding on the parties and that the Board can enter a judgment based thereon.

A copy of the arbitration award must be filed within 20 days from the date of the award or by the date set by the examiner-in-chief.

If the proceeding is in the testimony stage and the parties desire to arbitrate, the examiner-in-chief could grant a reasonable extension for that purpose. A motion for a further extension for that purpose would not be granted unless it is accompanied by a schedule, agreed to by the parties, setting forth, *inter alia*, the dates for (1) executing the arbitration agreement, (2) determining priority, and (3) terminating the interferences. If the parties were to submit the required schedule, a motion for a further extension could be granted. If the parties file a copy of the arbitration agreement and they agree that any evidence submitted in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) of (f), the examiner-in-chief could give favorable consideration to the parties' motion that all the unexpired times be extended to close concurrently on the date the record is due. By that date, the parties would be required to file the arbitrator's award and their records, if necessary for the resolution of any issue not decided by the arbitrator. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would set brief times so that the parties could explain their evidence relating to any issues which the arbitrator did not, or was unable to, decide. For example, the award might be dispositive of the issue of priority between the parties and leave for the Board's determination the question of substituting a new count raised in a preliminary motion under 37 CFR 1.633.

The arbitration award, filed by the parties, would be in the nature of a final decision and must include the following:

(1) The style (e.g., *Jones* v. *Smith*), the number of the interference and the names of the real parties in interest.

(2) The subject matter in issue, i.e., the counts and a table of counts, if necessary, indicating the relationship of the parties' claims corresponding to each count and those claims not corresponding thereto.

(3) The issues for decision before the arbitrator.

(4) The arbitrator's decision. The decision may also include a statement of the grounds and reasoning in support thereof.

(5) A summary, if appropriate, indicating, inter alia, that judgment should be awarded to one of the parties.

Any party to the arbitration can attack the award only in the manner provided by 9 U.S.C. 10 and 11.

9 U.S.C. 10 reads as follows:

In either of the following cases the United States court in and for the district wherein the award was made may make an order vacating the award upon the application of any party to the arbitration—

(a) Where the award was procured by corruption, fraud, or undue means.

(b) Where there was evident partiality or corruption in the arbitrators, or either of them.

(c) Where the arbitrators were guilty of misconduct in refusing to postpone the hearing, upon sufficient cause shown, or in refusing to hear evidence pertinent and material to the controversy; or of any other misbehavior by which the rights of any party have been prejudiced.

(d) Where the arbitrators exceeded their powers, or so imperfectly executed them that a mutual, final, and definite award upon the subject matter submitted was not made .

(e) Where an award is vacated and the time within which the agreement required the award to be made has not expired the court may, in its discretion, direct a rehearing by the arbitrators.

9 U.S.C 11 reads as follows:

In either of the following cases the United States court in and for the district wherein the award was

made may make an order modifying or correcting the award upon the application of any party to the arbitration—

(a) Where there was an evident material miscalculation of figures or an evident material mistake in the description of any person, thing, or property referred to in the award.

(b) Where the arbitrators have awarded upon a matter not submitted to them, unless it is a matter not affecting the merits of the decision upon the matter submitted.

(c) Where the award is imperfect in matter of form not affecting the merits of the controversy.

The order may modify and correct the award, so as to effect the intent thereof and promote justice between the parties.

See, for example, *Fairchild & Co., Inc.* v. *Richmond, F. & .P. R. Co.*, 516 F.Supp. 1305 (D.D.C. 1981). If such an attack were to be made by one of the parties while the interference is pending before the Board, the Board would not stay the interference. Rather, the Board would issue its judgment in accordance with the award. So long as the award is in compliance with proposed § 1.690, it would carry the presumption that the arbitrator acted correctly in making his decision and accordingly, the party designated by the award as the prevailing party would be entitled *prima facie* to a judgment in its favor. If the dissatisfied party brings an action in an appropriate United States district court and if the court vacates, modifies or corrects the award, the Board would take action consistent with the court's findings. No action would like in the PTO to vacate or correct an arbitration award, unless all parties agreed in writing.

The following examples illustrate the proposed practice of the PTO concerning arbitration.

Example 1

Arbitration Practice—Preliminary Stage

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The parties decide to arbitrate the interference in accordance with proposed § 1.690 and file a motion for an extension of time so that they can "freely" arbitrate the interference, but do not file a waiver of their right to file motions.

The examiner-in-chief would deny the motion because the parties' intention to arbitrate, in and of itself, does not constitute a showing of "good cause" within the meaning of 37 CFR 1.645(a). Even if the parties file an agreement to arbitrate, the PTO would not grant any extension of time to permit the parties to "freely" arbitrate an interference prior to the expiration of the time for filing preliminary motions.

Example 2

Arbitration Practice—Testimony Stage

An interference is delcared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633. The parties file preliminary motions; the examiner-in-chief renders a decision thereon and sets the testimony times. The parties file a notice of intent to arbitrate the interference under proposed §1.690(a) and a motion for a one month extension of the testimony times. The examiner-in-chief could grant the motion, but would indicate that if the parties file another motion for an extension for that purpose, the motion must be accompanied by a schedule, agreed to by the parties, setting forth the dates for (1) executing the arbitration agreement, (2) determining priority and (3) terminating the interference.

The parties file a motion for an additional one month extension of time to permit the parties to arbitrate the interference. Accompanying the motion is a proposed schedule of times and a copy of the arbitration agreement which provides, inter alia, (i) the name of the arbitrator or a date certain for his selection, (ii) that the arbitrator's award will be binding on the parties, (iii) the issues to be decided by the arbitrator and (iv) that the award will be filed by the date the record is due. The parties also indicate that the evidence to be filed in the proceeding will be in one of the forms specified by 37 CFR 1.672(e) of (f). The examiner-in-chief could grant the motion and indicate that he will give favorable consideration to a motion to extend all the unexpired times to close concurrently on the date the record is due should the parties request such.

On the date for filing the record, the parties file the arbitrator's award and their evidentiary records, if necessary. The award states (i) the style and number of the interference and the real parties in interest, (ii) the subject matter in issue and the parties' claims which correspond thereto and which do not correspond thereto, (iii) the issues for decision before the arbitrator, (iv) the arbitrator's decision (which may include a statement of the grounds and reasoning in support thereof) and (v) that judgment should be awarded to one of the parties. The examiner-in-chief examines the award to ensure that it complies with proposed §1.690 and is dispositive of the issues in the interference which can be decided by the arbitrator. If the award is otherwise acceptable, the Board would issue a judgment based on the award. If the award is not dispositive of all the issues in the interference, the examiner-in-chief would determine how the interference will proceed.

Example 3

Arbitration Practice—Award Decides Interference-in-Fact Issue and Junior Party Takes No Testimony

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(b) on the ground that there is no interference-in-fact between his claims corresponding to the count and his opponent's claims corresponding thereto. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. On the date for filing the record, the junior party files the award together with a motion requesting that the interference be terminated in view of the award. He does not file a record. In his award the arbitrator holds that no interference-in-fact exists between the parties' claims corresponding to the count.

The motion would be denied because the award decides a matter of patentability which would not result in a judgment adverse to one of the parties. Consequently, the junior party would be placed under an order to show cause why judgment under 37 CFR 1.652 should not be entered against him for his failure to file an evidentiary record by the time set therefor. In response to the order, the junior party requests final hearing to review the examiner-in-chief's denial of the motion for judgment and a testimony period to show no interference-in-fact. The examiner-in-chief would grant the junior party's request to the extent that final hearing is set and would deny the request for testimony because the junior party already had the opportunity to take testimony on the matter.

Example 4

Arbitration Practice—Cannot Decide Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR

1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to the count are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to the count. In response to the order, the senior party files a paper in accordance with 37 CFR 1.640(e) purportedly showing good cause why judgment should not be entered in accordance with the order and a motion requesting permission to arbitrate the patentability issue. The examiner-in-chief would deny the motion. The arbitrator is without authority to establish vis-a-vis the public that the subject matter of the count is patentable. Thus, the arbitration will serve no useful purpose. The Board would consider the senior party's paper and enter an appropriate order.

Example 5

Arbitration Practice—Award After Decision on Motions

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion for judgment under 37 CFR 1.633(a) on the ground that the claims corresponding to counts 1 and 2 are unpatentable over prior art. In his decision on motions, the examiner-in-chief grants the motion with respect to count 1, denies the motion with respect to count 2 and places both parties under an order pursuant to 37 CFR 1.640(d)(1) to show cause why judgment should not be entered against them as to count 1. The senior party files a paper in accordance with 37 CFR 1.640(e); the junior party, a response thereto. The Board considers the paper and the response thereto and based on the record enters judgment adverse to both parties as to count 1. Thereafter, the examiner-in-chief examines the preliminary statements and sets dates for taking testimony and filing the record.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator decides that judgment should be awarded to the junior party. On the date for filing the record, both parties file the award together with a motion requesting that the interference be terminated in view of the award. No record is filed.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to count 2.

Example 6

Arbitration Practice—Award Decides Patentability

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions for judgment under 37 CFR 1.633 are filed and after the examination of the preliminary statements, the examiner-in-chief sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intent to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief. In his award, the arbitrator finds (1) that the evidence is insufficient to establish a prior public use bar under 35 U.S.C. 102(b) against the junior party, (2) that the claims of the junior party corresponding to the count are patentable under 35 U.S.C. 103 over the prior art cited by the senior party to the junior party, and (3) that judgment on priority should be awarded to junior party. On the date for filing the record, the parties file their records and the award together with a motion requesting that the interference be terminated in view of the award.

The motion would be granted and accordingly it would be held that the senior party is not entitled to a patent containing his claims corresponding to the count. After the termination of the proceeding, each party has the duty under 37 CFR 1.56 to bring before the primary examiner the evidence concerning the purported public use bar and the prior art cited by the senior party and/or considered by the arbitrator.

Example 7

Arbitration Practice—Award Grants Priority to Junior Party Contingent Upon Granting of Preliminary Motion Under 1.633(c)

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. The junior party files a motion under 37 CFR 1.633(c)(1) to substitute another count. The examiner-in-chief denies the motion, examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and enter into an arbitration agreement which is approved by the examiner-in-chief. The agreement provides that any evidence to be submitted by the parties will be in the form of a stipulation under 37 CFR 1.672(e) and (f). The parties file a motion requesting that all the unexpired testimony times be extended to close concurrently on the date the record is due. The motion would be granted.

On the date for filing the record, the junior party files his record and the award. The award states, inter alia, that if the Board at final hearing should grant the junior party's motion under 37 CFR 1.633(c)(1) to substitute a new count, judgment should be awarded to the junior party based on the evidence. Otherwise, the award states that judgment should be awarded to the senior party.

The examiner-in-chief sets the brief times and after the filing thereof the interference would be set for final hearing so that the Board can review the examiner-in-chief's denial of the junior party's motion under 37 CFR 1.633(c) and issue an appropriate judgment based on the award.

Example 8

Arbitration Practice —Award Attacked

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No preliminary motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference, notify the examiner-in-chief of their intention to arbitrate and file an arbitration agreement which is approved by the examiner-in-chief.

On the date for filing the record, both parties file their records. The junior party files the award which states that judgment should be awarded to him and a motion for judgment based on that award. The senior party files an opposition to the motion for judgment on the grounds (i) that the award contains errors of law, (ii) that the award was procured by "corruption, fraud or undue means" in violation of 9 U.S.C. 10(a), and (iii) that the arbitrator exhibited "evident partiality" in violation of 9 U.S.C. 10(b) and was "guilty of misconduct . . . in refusing to hear evidence pertinent and material" to the interference, citing 9 U.S.C. 10(c).

The Board would grant the judgment based on the award, holding that the senior party is not entitled to a

patent containing his claims corresponding to the count. So long as the award is in compliance with the provisions of proposed §1.690, it would carry a presumption that the arbitrator acted properly in all respects. Consequently, before the PTO the award is binding upon the parties and the junior party is *prima facie* entitled to a judgment in its favor. Thus, no action lies in the PTO as regards the matter raised by the senior party. The senior party's action lies in an appropriate United States district court and the PTO would take any action consistent with the court's decision.

Example 9

Arbitration Practice—Award Cannot Modify Board's Final Decision

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of their intent to arbitrate nor do they file a copy of the agreement in the interference. Both parties timely file their records and briefs. Both waive oral agrument. The Board enters a final decision after consideration of the evidence in favor of the senior party.

The junior party requests reconsideration of the Board's final decision, submits a copy of the arbitration award and moves that the Board set aside its final decision and enter judgment in his favor based on the award. In support of its request, the junior party cites 9 U.S.C. 9, which provides that "any party to the arbitration may apply to the court so specified for an order confirming the award" and 35 U.S.C. 135(d) which provides that title 9 applies to interference arbitrations.

The Board would deny the motion to set aside. The parties did not comply with proposed §1.690(a), e.g., notify the examiner-in-chief in writing of their intention to arbitrate and file a copy of the arbitration agreement within twenty (20) days of its execution. The denial of the motion is an appropriate sanction under 37 CFR 1.616. Such action by the Board is considered consistent with long-standing interference practice. Cf. *Humphrey* v. *Fickert*, 1904 Dec. Comm'r. Pat. 447 (Comm'r. 1904) wherein the Board, after it had considered the evidence, refused to set aside its award of priority to Fickert and act upon the Fickert's concession of priority in favor of Humphrey, the losing party.

Example 10

Arbitration Award Filed With Record—No Notice to Examiner-in-Chief

An interference is declared on or after Feb. 11, 1985. The examiner-in-chief sets a time in accordance with 37 CFR 1.611 for filing preliminary motions under 37 CFR 1.633 and preliminary statements. No motions are filed. The examiner-in-chief examines the preliminary statements and sets the testimony times.

During the testimony period, the parties decide to arbitrate the interference and enter into an arbitration agreement. Neither party notifies the examiner-in-chief of the agreement. The junior party timely files its record together with a copy of the arbitration award and a motion for judgment based on the award.

The motion would be denied. Under the provisions of 37 CFR 1.616, the examiner-in-chief places both parties under an order to show cause why judgment should not be rendered against them for their failure to comply with proposed §1.690(a), i.e., failing to notify him of their intent to arbitrate and file a copy of the arbitration agreement.

Analysis of Comments

One commentor suggests that the parties should be able to arbitrate at any stage of the proceeding, including immediately after the declaration of the interference. Another commentor suggests that arbitration should not be instituted until after the motion period when the issues have been finally determined. The parties can begin arbitration at any stage of the interference; however, no extension of the time for filing preliminary motions will be granted for the purpose of arbitration. See Example 1. No change is necessary to the rule proposed in the advance notice.

One commentor suggests that the PTO should become involved in the selection of the arbitrator by maintaining a roster of arbitrators. This suggestion is not being adopted because the selection of an arbitrator is a matter for the parties.

One commentor notes that the American Arbitration Association (AAA) has developed rules for handling patent matters and requests that the PTO "give notice that following AAA rules is prima facie acceptable, as to the procedure used." In the PTO's view, the parties can stipulate the use of any procedure for resolving the arbitration.

One commentor suggests that the arbitrator should be able to "certify questions to the Board." The statute, 35 U.S.C. 135(d), and proposed §1.690 provide that the parties may determine the interference or "any aspect thereof by arbitration." If the parties elect to arbitrate, the arbitrator must decide the interference. He cannot "certify" questions to the Board since "certification" would defeat the purpose of arbitration.

One commentor suggests that

> [The] arbitrator should have subpoena power or discovery authority to protect his own reputation in the event (a) a party is withholding information or (b) the parties are colluding in withholding information from the arbitrator.

While the arbitration proceeding is pending before him, the arbitrator has the authority under 9 U.S.C. 7 to

> summon in writing any person to attent . . . as a witness and in a proper case to bring with him . . . any book, record, document or paper which may be deemed material in the case.

If any person so summoned refuses or neglects to obey the summons, the arbitrator or a party may petition an appropriate United States district court pursuant to 9 U.S.C. 7 to compel the attendance of the person or to punish the person for contempt.

With respect to proposed §1.690(a), one commentor urges that the subparagraph be changed by deleting "or any aspects thereof" so that the arbitrator can determine priority in its totality. The commentor believes that the retention of this language would tend to cause undue delays, thus requiring the examiner-in-chief to exert strong control in maintaining the schedule for an interference. The suggestion is not being adopted because the statute 35 U.S.C. 135(d), provides:

> Parties to a patent interference . . . may determine such contents *or any aspect thereof* by arbitration. [Emphasis added.]

To adopt this suggestion would constitute taking from interference parties a right conferred on them by statute.

With respect to proposed §1.690(a), one commentor suggests that a provision be added to the proposed rule requiring "advance notice to the examiner-in-chief of a proposed arbitration and specifying the issues to be arbitrated." This suggestion is being adopted and accordingly the following two sentences are added to proposed§1.690(a):

The parties must notify the Board in writing of their intention to arbitrate and specify the issues to be arbitrated. A copy of an agreement to arbitrate must be in writing and filed within twenty (20) days after its execution.

These two sentences require that the notification of intent to arbitrate must be in writing and should be presented in a separate paper, directed to the examiner-in-chief's attention and that the agreement to arbitrate must be in writing and be filed within twenty (20) days after its execution.

With respect to proposed §1.690(b), one commentor states:

Proposed sub-section (b) states that "(b) An interference or any aspect thereof shall be arbitrated within such time as may be authorized on a case by case basis by an examiner-in-chief." Since this is indefinite, it would in actual practice require obtaining advance approval from the examiner-in-chief in every case before even initiating arbitration efforts. Since this provision provides no guidance to the examiner-in-chief it could also lead to arbitrarily restrictive decisions. That seems contrary to the intent of the statute, which is to broadly provide a generally available resolution of disputes by the parties outside of the PTO. Furthermore, this provision even seems inconsistent with the practice until now under interference rule 272(c) [37 CFR 1.272(c) (1984)] which already allowed the parties, without advance approval by anyone, to stipulate to dispositive facts at any time during the testimony period or before the record was due. Yet an arbitration may well constitute or provide such stipulations. As with stipulations under 272(c), since any arbitration decisions are to the direct benefit of the PTO in reducing issues which must otherwise be decided by the Board at final hearing, there is no logical reason to restrict the availability of arbitration at any time before the filing of final briefs with the Board. It is respectively submitted that, pursuant to the intent of the statute, it is really not the appropriate business of the PTO as to when the parties conduct arbitration as long as it does not interfere with the orderly operation of interferences or cause the Board to unnecessarily decide an issue which is being arbitrated. The purpose of this statute is to provide maximum flexibility to the parties, free of regulatory constraints, and that is what the enabling regulations for the statute should provide.

Accordingly, it is suggested that this proposed subsection (b) be changed to: — any arbitration shall be completed and noticed by the time set for the filing of final briefs.—

These comments, which are essentially directed to the guidelines for arbitration, the authority of the examiner-in-chief vis-a-vis the rights of the parties to "freely" arbitrate and an apparent inconsistency between the old practice and the new practice, have been carefully considered. In addition, the commentor suggests that proposed §1.690(b) be changed to state that the arbitration be completed and noticed by the time set for the filing of final briefs.

The arbitration guidelines are sufficiently discussed in the section, "Guidelines For Arbitration," *supra*, and will not be discussed below.

With respect to the authority of the examiner-in-chief and the rights of the parties, advance approval by the examiner-in-chief is required for the parties to arbitrate in order to prevent unnecessary work in the PTO. The parties must file their preliminary motions by the time set therefor and any arbitration must conform with the time schedule approved by the examiner-in-chief. If the parties are unable to meet the time schedule, they may file a motion for extension of time pursuant to the provisions of 37 CFR 1.645(a). Pursuant to 37 CFR 1.610(c), the examiner-in-chief must exercise control over the interference such that its pendency does not normally exceed two years. Consequently, the parties must notify the Board of their intention to arbitrate and file a copy of the arbitration agreement. When the award is filed, the examiner-in-chief must review the award to determine whether it is dispositive of all the issues in the interference. If the award is not, the examiner-in-chief must determine how the interference should proceed.

With respect to the assertion concerning an apparent inconsistency between proposed §1.690(b) and §1.672(e) and (f), the counterpart of §1.272(c), the guidelines show that none exists.The parties to an interference can agree to file stipulated evidence with respect to any issue whether or not it is decided by arbitration.

The suggestion that proposed §1.690(b) be changed is not being adopted in view of the language in proposed § 1.690(c), infra.

Three commentors request that the arbitration award be made binding on the parties in order to save expense and reduce the pendency time of the interference proceeding. It is urged that if the arbitration is not binding, the arbitration would "serve as a rehearsal for the usual interference procedure." This suggestion is being adopted and proposed §1.690(c) is being changed to require that the parties who desire to arbitrate must enter into a binding arbitration agreement.

One commentor suggests that if the arbitration is binding, then the reasons and conclusions need not be given but if the arbitration is not binding, then the reasons and conclusions for the award should be given so as to aid settlement. Another commentor concerned with possible "colusion" between the parties and the arbitrator and suggest that a "sufficient record" be created for the PTO and "interested third parties." These suggestions are being adapted in part. While the PTO would prefer that the award include a statement of the grounds and reasoning in support thereof, it is left to the discretion of the parties as to whether the award will contain such a statement. With respect to possible "collusion," the attorneys for the parties are subject to the Patent and Trademark Code of Professional Office Responsibility, 37 CFR 10.20 to 10.112, and any violation thereof can be brought to the attention of Director of Enrollment and Discipline. Accordingly, proposed §1.690(c) is being changed to state that the award may also include a statement of the grounds and reasoning in support thereof.

Two commentors suggest that proposed §1.690(c) be changed to read that the arbitration award should be filed on or prior to the date set for the filing of final briefs so that the PTO need not decide an interference which has already been resolved by the parties. This suggestion is being adopted to the extent that proposed §1.690(c) is being changed to require that the parties must file a copy of the arbitration award within twenty (20) days from the date of the award unless otherwise ordered by the examiner-in-chief.

One commentor requests that a "reasonable grace period" be provided for filing an inadvertently unfiled award. Proposed §1.690(c) has been changed to read that the parties must file the award within twenty (20) days from the date of the award unless otherwise ordered by the examiner-in-chief. If the award is not filed, the examiner-in-chief may issue appropriate sanctions under 37 CFR 1.616. Accordingly, this suggestion is not being adopted.

In view of the foregoing discussion, proposed §1.690(c) has been modified to read as follows:

An arbitration award will be given no consideration unless it is binding on the parties, is in writing and states in a clear and definite manner (1) the issue or issues arbitrated and (2) the disposition of each issue. The award may also include a statement of the grounds and reasoning in support thereof. Unless otherwise ordered by an examiner-in-chief, the parties shall give notice to the Board of an arbitration award by filing within twenty (20) days from the date of the award a copy of the award signed by the arbitrator or arbitrators. When an award is timely filed, the award shall, as to the parties to the arbitration, be dispositive of the issue or issues to which it relates.

Two commentors urge that patentability questions should not be arbitrated in view of the public interest.

One would go further and amend subparagraph (d) to read that unless ordered by an examiner-in-chief, an arbitration award shall not decide a preliminary motion for judgement under §§1.633(a) or 1.633(b), a preliminary motion to redefine the interfering subject matter under §1.633(c), a preliminary motion to substitute a different application under §1.633(d) or a motion to declare an additional interference under §1.633(e). These suggestions are not being adopted. Subparagraph (d) makes clear that an arbitration award shall not preclude the Office from determining patentability of any invention in the interference. An arbitration award can decide a question of patentability which is binding on that party vis-a-vis his opponent and will result in a judgement adverse to that party. After the termination of the interference each party has the duty under 37 CFR 1.56 to bring to the attention of the examiner in charge of its application any evidence of unpatentability brought before or considered by the arbitrator. Consequently, the adoption of these suggestions could unduly restrict the parties' use of arbitration and prevent an arbitrator from deciding a proper matter of patentability.

Other Considerations

This rule does not have a significant impact on the quality of the human environment or the conservation of natural resources.

The rule is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The General Counsel of the Department of Commerce certified to the Small Business Administration that the proposed rule will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-354) because arbitration is intended to minimize expenses in interference cases.

The Patent and Trademark Office has determined that this rule is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

The rule will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq., since no record keeping or reporting requirements within the coverage of the Act are placed upon the public.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delations, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set out in the preamble and under the authority given to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 135, Part 1 of Title 37 CFR is proposed to be amended as follows:

PART 1-RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 would continue to read as follows:

Authority: 35 U.S.C. 6 unless otherwise noted.

2. New section 1.690 is proposed to be added to read as follows:

§1.690 Arbitration of Interferences.

(a) Parties to a patent interference may determine the interference or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of Title 9, United States Code. The parties must notify the Board in writing of their intention to arbitrate. An agreement to arbitrate must be in writing, specify the issues to be arbitrated, the name of the arbitrator or a date not more than 30 days after the execution of the agreement for the selection of the arbitrator, and provide that the arbitrator's award shall be binding on the parties and that judgement thereon can be entered by the Board. A copy of the agreement must be filed within twenty (20) days after its execution. The parties shall be solely responsible for the selection of the arbitrator and the rules for conducting proceedings before the arbitrator. Issues not disposed of by arbitration will be resolved in accordance with the procedures established in 37 CFR, Subpart E of Part 1, as determined by the examiner-in-chief.

(b) An interference or any aspect thereof shall be arbitrated within such time as may be authorized on a case-by-case basis by an examiner-in-chief.

(c) An arbitration award will be given no consideration unless it is binding on the parties, is in writing and states in a clear and definite manner (1) the issue or issues arbitrated and (2) the disposition of each issue. The award may also include a statement of the grounds and reasoning in support thereof. Unless otherwise ordered by an examiner-in-chief, the parties shall give notice to the Board of an arbitration award by filing within twenty (20) days from the date of the award a copy of the award signed by the arbitrator or arbitrators. When an award is timely filed, the award shall, as to the parties to the arbitration, be dispositive of the issue or issues to which it relates.

(d) An arbitration award shall not preclude the Office from determining patentability of any invention involved in the interference.

DONALD J. QUIGG,
Apr. 7, 1986 *Assistant Secretary and Commissioner of Patents and Trademarks.*

[FR Doc. 86-20629 Filed 9-9-86; 8:45 am]

BILLING CODE 3510-16-M

Office of Patents and Trademarks
Revision of the Scope of the Secrecy Order for Defense Agency Use

The Patent and Trademark Office (PTO) is revising the scope and format of the Secrecy Orders issued under the Invention Secrecy Act of 1951, 35 U.S.C. 181 et seq., 37 CFR Part 5. The present forms of Secrecy Orders are very restrictively worded to control disclosure or use of an invention under Secrecy Order. The PTO previously would only authorize disclosure or use of a Secrecy Order invention by the grant of a special permit. Permits authorize limited disclosure and permissible use of the invention depending upon the nature of the technical data and national security controls. To receive a permit, a patent applicant had to petition the Commissioner, or the defense agency sponsoring the Secrecy Order would issue or could have sua sponte issued a permit with the Order.

The revised Secrecy Orders will permit disclosure and use consistent with the national security controls needed on the technical data in a patent application. The features of existing permits are incorporated into the Orders which will eliminate the need, in many cases, for the applicant to separately petition for a permit to authorize various degrees of disclosure or use.

These revisions to the scope and format of a Secrecy Order are intended to place essentially the same national security controls on the technical data in patent applications as those on other types of technical data. With respect to publication or disclosure of information which

would, in the opinion of the sponsoring Agency, be detrimental to the national security, the revised Secrecy Orders will be consistent with existing national security and export control procedures. The revised Secrecy Orders will also clarify the procedures for handling and custody of applications subject to a Secrecy Order.

The three new Secrecy Order formats to be used by the defense agencies of the Department of Defense are as follows:

(1) Secrecy Order and Permit for Foreign Filing in Certain Countries

This Secrecy Order will be used for those patent applications that contain technical data whose export is controlled by the guidelines contained in DOD Directive 5230.25, dated Nov. 6, 1984, (codified as 32 CFR Part 250) which relates to export control under 10 U.S.C. 140(c) and the Militarily Critical Technologies List (MCTL). See 50 U.S.C. App. 2404(d).

This Secrecy Order is intended to permit widest utilization of the technical data while still controlling any publication or disclosure which would result in an unlawful exportation. This type of Secrecy Order sets forth the applicable export controls for technical data in either the Commodity Control List (CCL) 15 CFR Parts 379, 399.1 or the Munitions List of the International Traffic in Arms Regulation (ITAR), 22 CFR Part 121.

The countries where corresponding patent applications may be filed will be identified in the Order. The Order specially authorizes use of the invention for legitimate business purposes. The definition of this term in the Order is identical to that found in DOD Directive 5230.25, 32 CFR Part 250. The level of security control requires that the subject matter must be safeguarded under conditions that provide adequate protection and prevent access by unauthorized persons. Additional modifications or permits to the Secrecy Order under 37 CFR 5.1 et seq. will only be needed where the level of disclosure is beyond that specified in the Order.

Following is a sample copy of this type of Secrecy Order.

Serial No.:
Filed:
Applicant:
Title:
Sponsoring Agency & Address:

ECCN[1] Reference

Goods Accompanied by Sophisticated Know-How
Keystone Equipment or Materials

ITAR[2] Reference

Goods Accompanied by Sophisticated Know-How

Secrecy Order and Permit for Foreign Filing in Certain Countries

(Title 35, United States Code, Sections 181–188 (1952))

NOTICE: To the applicant(s) above named; his, her, or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter which discloses critical technology with military or space application. The unauthorized disclosure of such subject matter would be detrimental to the national security, and you are ordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized herein.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified application falls within the scope of this Order. If such other patent application is not under Secrecy Order imposed by the U.S. Patent and Trademark Office, it and the common subject matter need to be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231 as soon as possible.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patents and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, 185 and 186 (1952).

The principals may disclose, for legitimate business purposes,[3] the subject matter of the above-identified application to a U.S. citizen or to a person who is both admitted lawfully into the United States for permanent residence and is located in the United States provided the U.S. citizen or person is furnished with a copy of this Secrecy Order and is informed that this Secrecy Order is applicable to the subject matter disclosed.

Legitimate business purposes include both selling or producing products for the commercial domestic marketplace or for the commercial foreign marketplace, providing that any required expert license is obtained. Legitimate business purposes also include selling or otherwise disclosing technical data to foreign contractors or governments overseas after receiving the required export license or approval by the U.S. Government.

The principals shall notify the Commissioner of Patents and Trademarks if a validated license is obtained from the Office of Export Administration or a license is obtained from the Director, Office of Munitions Control under regulations governing the export of technical data (15 CFR 379 of the Export Administration Regulations or 22 CFR 125 of the International Traffic in Arms Regulations).

The subject matter of the above-identified application has been determined not to be encompassed by E.O. 10865, entitled "Safeguarding of Classified Information Within Industry" or E.O. 12356, entitled "National Security Information" and thus is not subject to the "Industrial Security Manual for Safeguarding Classified Information." However, since the disclosure of the subject matter would be detrimental to the national security, the subject matter must be safeguarded under conditions that will provide adequate protection and prevent access by unauthorized persons. When copies of the subject matter are no longer needed, they should be destroyed by any method that will prevent disclosure of the contents or reconstruction of the document.

The principals are permitted, subject to the conditions stated hereinafter, to file and prosecute a corresponding application for patent in each of the following countries: Australia, Belgium, Canada, Denmark, France, Federal Republic of Germany, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Sweden, Turkey and the United Kingdom. The papers for each foreign application and its prosecution shall be transmitted to the sponsoring agency, identified herein, for forwarding through diplomatic channels for filing in the foreign country either directly by the principals or through the principals' foreign patent attorney or agent if authorized by the foreign government. Correspondence exclusively relating to payments of taxes and fees need not be sent

---

[1]Export Control commodity Number (ECCN) on the Commodity Control List (Supplement No. 1 to 15 CFR 399.1).

[2]International Traffic in Arms Regulation (ITAR), 22 CFR 120–130.

[3]The term legitimate business purposes is to be interpreted consistent with DOD Directive 5230.25 entitled "Withholding of Unclassified Technical Data From Public Disclosure," issued by the Secretary of Defense on Nov. 6, 1984, 32 CFR Part 250, 49FR 484040 (Dec. 10, 1984).

provided that such correspondence contains no information pertaining to the subject matter of the above-identified application.

International reciprocal agreements providing for the filing of patent applications under a Secrecy Order in the above-identified countries require the principals to furnish to the sponsoring agency identified herein (in addition to the papers to be filed in the foreign patent office) a copy of the specification (including any drawings annexed thereto, any resume and the claims included in the patent application) filed in the patent office of the foreign country. This copy will be furnished to the appropriate defense agency of the foreign government *for information only* and without prejudice to any rights of the principals. The filing date and serial number of the patent application should also be furnished to the sponsoring agency.

The principals shall request the foreign patent office to place in secrecy the foreign patent applications corresponding to the above-identified application and shall furnish a copy of this Secrecy Order and permit with the first papers to be filed in the foreign patent office.

The foreign government may require a waiver in writing of any claim to compensation for loss or damage due solely to the imposition of secrecy on the invention. Belgium, France, the Federal Republic of Germany, the Netherlands, Turkey and the United Kingdom normally require such a waiver in writing.

This Order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration.

(2) Secrecy Order and Permit for Disclosing Classified Information

This Secrecy Order will be used for those patent applications which contain technical data that is either classified under Executive Order 12356, National Security Information, 47 FR 14874, Aug. 6, 1982, or properly classifiable under a security guideline where the patent application owner has a current DOD Security Agreement, DOD form 441. This Agreement requires the protection of classified technical data as prescribed in the Industrial Security Manual (ISM), DOD 5220.22-M.

The intent of this Secrecy Order is to treat classified technical data in a patent application in the same manner as any other classified material under the Industrial Security Manual (ISM). Accordingly, this Secrecy Order will include a notification of the classification level of the technical data in the application, and provided a level of protection at that classification level. The Order will apply to owners of patent applications who have a current DOD Security agreement (DD Form 441) under the ISM. Additional modifications or permits to the Secrecy Order under 37 CFR 5.1 et seq. will only be needed where the level of disclosure is beyond that specified in the order.

The following is a copy of this second type of Secrecy Order:

Serial No:
Filed:
Applicant:
Title:
To be protected at Classification Level of:
Top Secret, Secret, Confidential, or Special Instructions
Sponsoring Agency & Address:

Secrecy Order and Permit for Disclosing Classified Information

(Title 35, United States Code, sections 181-188 (1952))

NOTICE: To the applicant(s) above named, his, her, or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

Your are hereby notified that the above-identified patent application has been found to contain subject matter which discloses classifiable information. The unauthorized disclosure of such matter would be detrimental to the national security, and you are ordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized herein.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified patent application falls within the scope of this Order. If such other patent application is not under a Secrecy Order imposed by the U.S. Patent and Trademark Office, it and the common subject matter need to be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231 as soon as possible.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patent and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, and 186 (1951).

The subject matter of the above-identified application has been determined to be encompassed by E.O. 19865, entitled "Safeguarding of Classified Information Within Industry" or E.O. 12356, entitled "National Security Information" and thus is subject to the "Industrial Security Manual for Safeguarding Classified Information."

The principals shall protect the subject matter as required by the Industrial Security Manual for Safeguarding Classified Information and may disclose the subject matter of the above-identified application to other persons having the requisite clearance on a "need-to-know basis" *provided* the person to whom the subject matter is disclosed is furnished with a copy of this Secrecy Order and is informed that this Secrecy Order is applicable to the subject matter disclosed. The declassification, in whole or in part, of the subject matter of the above-identified application does not modify this Secrecy Order. The requirements of this Secrecy Order remain in effect until the Secrecy Order is rescinded or modified by the Commissioner of Patent and Trademarks. The fact that the subject matter as a whole is declassified should be brought to the attention of the sponsoring agency.

This permission to disclose does not authorize the disclosure of the subject matter of the above-identified application through (1) the filing of any foreign application without specific permission of the Patent and Trademark Office, or (2) the export of any item or data without any export license which may be required.

This order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration.

(3) Secrecy Order

This Secrecy Order will be used for those patent applications that contain properly classifiable technical data under a security guideline where the patent application owner does not have a DOD Security Agreement under the ISM.

This Secrecy Order is substantially the same as the Secrecy Order in use up to now, and will be used where the other types of Orders do not apply. This Order may be issued by direction of agencies other than the Department of Defense. Unless issued with the initial Order, modifications to the Secrecy Order and/or permits un-

der 37 CFR 5.1 et seq. will be needed for additional disclosure.

The following is a copy of this third type of Secrecy Order:

Serial No:
Filed:
Application:
Title:
Sponsoring Agency & Address:

Secrecy Order

(Title 35, United States Code, sections 181–188 (1952))

NOTICE: To the applicant(s) above named; his, her or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter the unauthorized disclosure of which would be detrimental to the national security, and you areordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized by the Commissioner of Patents and Trademarks.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified patent application falls within the scope of this Order. If such other patent application is not under a Secrecy Order imposed by the U.S. Patent and Trademark office, it and the common subject matter need to be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231 as soon as possible.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patents and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, 185 and 186 (1952).

Since the disclosure of the subject matter of the above-identified application would be detrimental to the national security, the subject matter must be safeguarded under conditions that will provide adequate protection and prevent access by unauthorized persons. When copies of the subject matter are no longer needed, they should be destroyed by any method that will prevent disclosure of the contents or reconstruction of the document.

This order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration.

Each Secrecy Order forbids the publication or disclosure of the invention except as specially authorized. By revising these Secrecy Orders to conform with existing export and classification authority, the burden on patent applicants to seek additional permits for disclosure and/or foreign filing under 37 CFR Part 5 will be reduced. The new Secrecy Orders reflect the level of secrecy required by law and regulation for various technologies and will place National Security and export controls on the patent application in harmony with other applicable export and classification controls. Also, this change will reduce the risk of disclosure of the subject matter of the invention by providing greater guidance on the safeguarding of the subject matter invention.

Information regarding the new Secrecy Orders may be obtained by calling Mr. Kenneth L. Cage, Director, Special Laws Administration Group, at (703) 557-2877 or by mail directed to Mr. Kenneth L. Cage, Director, Special Laws Administration, Group 220, Washington, D.C. 20231.

DONALD W. PETERSON,
Deputy Commissioner of Patents and Trademarks.

Sept. 9, 1986.

[FR Doc. 86-21023 Filed 9-16-86; 8:45 am]

BILLING CODE 3510-16-M

PATENT NOTICES

Certificates of Correction for the Week of Oct. 21, 1986

PP. 5,762	4,551,648	4,585,052	4,595,850
PP. 5,763	4,552,541	4,585,059	4,596,167
PP. 5,766	4,553,036	4,585,666	4,596,188
Re. 32,137	4,554,592	4,586,040	4,596,264
D. 278,615	4,554,845	4,586,042	4,596,371
D. 281,777	4,555,408	4,586,458	4,596,619
4,091,164	4,557,577	4,586,837	4,596,622
4,275,957	4,558,190	4,586,960	4,596,904
4,377,504	4,558,220	4,587,007	4,596,989
4,424,820	4,559,746	4,587,042	4,597,089
4,427,784	4,560,242	4,587,047	4,597,220
4,461,826	4,561,032	4,587,630	4,597,420
4,470,120	4,562,056	4,587,878	4,597,432
4,481,983	4,562,820	4,587,973	4,597,525
4,482,219	4,563,978	4,588,121	4,597,715
4,487,556	4,564,864	4,588,414	4,597,929
4,492,829	4,566,363	4,588,993	4,597,953
4,499,168	4,569,877	4,589,506	4,598,049
4,505,442	4,570,011	4,589,983	4,598,360
4,508,629	4,570,109	4,589,995	4,598,616
4,513,159	4,570,506	4,590,137	4,598,619
4,513,799	4,570,717	4,590,238	4,598,763
4,515,125	4,571,750	4,590,273	4,598,861
4,516,158	4,572,261	4,590,428	4,598,928
4,519,805	4,573,572	4,590,508	4,599,091
4,522,705	4,573,651	4,591,857	4,599,106
4,525,163	4,573,895	4,592,228	4,599,485
4,525,225	4,574,872	4,592,439	4,599,619
4,526,934	4,575,494	4,592,772	4,599,973
4,527,643	4,575,673	4,592,926	4,600,185
4,529,230	4,576,749	4,593,252	4,600,549
4,529,271	4,576,758	4,593,890	4,600,555
4,530,058	4,577,020	4,593,904	4,600,591
4,532,336	4,580,127	4,594,329	4,600,723
4,535,147	4,580,359	4,594,549	4,600,806
4,535,677	4,580,942	4,594,577	4,601,172
4,540,150	4,581,099	4,595,125	4,601,364
4,541,457	4,581,339	4,595,134	4,601,857
4,543,248	4,582,266	4,595,405	4,601,934
4,545,039	4,583,500	4,595,442	4,604,070
4,545,819	4,583,732	4,595,514	4,604,316
4,549,688	4,584,728	4,595,553	4,604,408
4,550,064	4,584,747	4,595,734	

Disclaimers

4,229,791.—*John V. Levy,* Palo Alto, Calif.; *David Rodgers,* Acton; *Robert E. Stewart,* Stow; *David Potter,* Pepperell and *Richard J. Casabona,* Stow, all of Mass. DISTRIBUTED ARBITRATION CIRCUITRY FOR DATA PROCESSING SYSTEM. Patent dated Oct. 21, 1980. Disclaimer filed July 24, 1986, by the assignee, *Digital Equipment Corp.*

Hereby enters this disclaimer to claims 1–5, 8–12, 14 and 15 of said patent.

4,295,497.—*Wilbur E. Tolliver,* Holland, Mich. VARIEGATED STIRRUP MAT. Patent dated Oct. 20, 1981. Disclaimer filed May 9, 1986, by the *inventor.*

Hereby enters this disclaimer to claims 1, 3, 5, 9, 12 and 13 of said patent.

4,330,296.—*Chandra P. Jain,* Placentia, and *Frank R. Shu,* Anaheim, Calif. ALBUMIN REAGENT AND ASSAY. Patent dated May 18, 1982. Disclaimer filed Aug. 21, 1986, by the assignee, *Beckman Instruments, Inc.*

The term of this patent subsequent to June 26, 1986, has been disclaimed.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Connecticut	New Haven: Science Park Library	(203) 786-5000
Delaware	Newark: University of Delaware Library	(302) 451-2965
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 13, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-21-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-08-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	10-09-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	4-11-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	4-25-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	11-09-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-17-84
DESIGN, GROUP 290—K. L. CAGE, Director	4-02-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-19-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-24-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-25-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	3-03-86

Expiration of patents: The patents within the range of numbers indicated below expire during September 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,464,063 to 3,470,563, inclusive

Plant Patents . . . . . Numbers 2,918 to 2,926 inclusive

REISSUES

OCTOBER 21, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

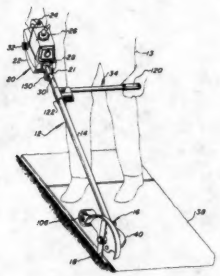
Re. 32,266
LAWN EDGER

Lloyd H. Tuggle, Shreveport; Ronald C. Loyd, Keithville, and Lee R. Walker, Shreveport, all of La., assignors to Emerson Electric Co., St. Louis, Mo.

Original No. 4,364,435, dated Dec. 21, 1982, Ser. No. 218,560, Dec. 22, 1980. Continuation-in-part of Ser. No. 51,950, Jun. 25, 1979, Pat. No. 4,286,675. Application for reissue Dec. 21, 1984, Ser. No. 684,666

Int. Cl. A01G *3/06;* **A01B** *45/04*

U.S. Cl. 172—15 **26 Claims**



22. A portable power operated implement comprising:

a tubular elongated support;

a power unit including a prime mover mounted on one end of said support;

a cutter head including a drive mechanism disposed at the opposite end of said support and drivably connected to a substantially vertically disposed rotary cutting blade;

drive shaft means extending within said support for drivingly interconnecting said power unit and said drive mechanism; and

adjustable surface engaging roller means mounted on said implement in the vicinity of said opposite support end at a location removed from the rotational path of said blade, said roller means being adapted by a surface engagement to partially support said implement to control the cutting depth of said blade.

Re. 32,267
PROCESS FOR DRILLING UNDERGROUND ARCUATE PATHS AND INSTALLING PRODUCTION CASINGS, CONDUITS, OR FLOW PIPES THEREIN

Martin D. Cherrington, Fair Oaks, Calif., assignor to Reading & Bates Construction Co., Tulsa, Okla.

Original No. 4,319,648, dated Mar. 16, 1982, Ser. No. 77,960, Sep. 24, 1979. Application for reissue Apr. 9, 1984, Ser. No. 598,189

Int. Cl.⁴ E21B *7/06, 10/26*

U.S. Cl. 175—53 **30 Claims**

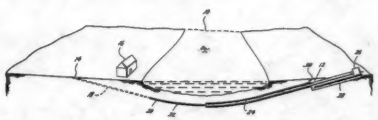
75. A method for placing a casing along an underground inverted arcuate path comprising

placing the casing on rollers located above and behind the point where said casing enters said path;

placing a pipe having two ends along an underground inverted arcuate path, until said pipe completely occupies said path;

thereafter attaching reaming apparatus to one end of said pipe;

attaching one end of said casing to said reaming apparatus in following relationship to said reaming apparatus; and



drawing said pipe along said path without rotating said casing, whereby said reaming apparatus and said casing are drawn along said path.

Re. 32,268
THERAPEUTIC COMPOSITION AND METHOD OF THERAPEUTICALLY TREATING WARM BLOODED ANIMALS THEREWITH

Paul Gordon, Chicago, Ill., assignor to Strategic Medical Research Corp., Greenwich, Conn.

Original No. 4,016,261, dated Apr. 5, 1977, Ser. No. 609,723, Sep. 2, 1975. Continuation of Ser. No. 224,438, Jan. 12, 1981, abandoned, which is a continuation-in-part of Ser. No. 29,040, Apr. 11, 1979, abandoned, which is a division of Ser. No. 337,134, Mar. 1, 1973, Pat. No. 3,939,145. Application for reissue Mar. 18, 1983, Ser. No. 474,734

Int. Cl.⁴ A61K *31/70*

U.S. Cl. 514—25 **43 Claims**

1. A [novel] therapeutic composition comprising a pharmaceutically acceptable carrier containing a therapeutically effective amount *for treating a warm blooded animal* of at least one [substance] *compound* selected from the group consisting of ethereally monosubstituted monosaccharides having the formula S-O-Y, and therapeutically effective and pharmaceutically acceptable organic acid and [inoragnic] *inorganic* acid salts thereof, wherein S is the residue of a [monosaccharide selected from the group consisting of pentoses, hexoses and heptoses] *hexose* and Y is selected from the group consisting of [cyclic monovalent nitrogen containing organic radicals] *piperidyl and pyrrolidyl radicals* and monovalent organic radicals having the general formula

$$-R_1-\underset{\displaystyle R_2}{\overset{\displaystyle |}{N}}-R_3,$$

wherein R_1 is a divalent organic radical having a [linear] carbon chain length of about [1–7] *1–4* carbon atoms and R_2 and R_3 are selected from the group consisting of [—H, —OH, —SH, halogen] *hydrogen* and monovalent organic radicals having a [linear] carbon chain length of about [1–7] *1–4* carbon atoms.

16. A [novel] therapeutic composition in accordance with claim 14 wherein Y is selected from the group consisting of (n-propylamino), (N',N'-dimethylamino-n-propyl), (N',N'-dimethylaminoisopropyl), (N-methyl piperidyl), (N',N'-dimethylaminoethyl), (N',N'-diethylaminoethyl), and (2',N',N'-trimethylamino-n-propyl).

PLANT PATENTS

GRANTED OCTOBER 21, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,791

ROSE PLANT/VAR. MORQUAKE

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Nov. 5, 1984, Ser. No. 668,251
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers having many petals (45 or more) and uniquely striped in shades of red and yellow, and further characterized by a plant of compact well rounded shape, vigorous, with the main stems and shoots being moderately thorny, the said plant being easy to propagate from cuttings or by budding, with an abundance of small semi-glossy foliage and an abundance of flowers borne singly or several to the stem in loose clusters.

5,792

LILY PLANT NAMED ORANGE PIXIE

Edward A. McRae, Boring, Oreg., assignor to Melridge Inc., Sandy, Oreg.

Filed Oct. 9, 1984, Ser. No. 659,238
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of hybrid Asiatic lily, substantially as herein shown and described, characterized by its single stem of reddish color, its abundant deep green foliage, and the brilliant orange color of the tepals when the flower is in bloom.

5,793

CARNATION NAMED LONSIMOX

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de la Londe, La Londe, France

Filed Nov. 8, 1984, Ser. No. 669,384
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—82 **1 Claim**

1. A new spray carnation cultivar, substantially as herein shown and described, characterized by the cyclamen red color of its medium sized flowers which are produced profusely during each of the recurrent blooming seasons; and by its vigorous growth habit which is resistant to *Fusarium oxysporum.*

PATENTS

GRANTED OCT. 21, 1986

ERRATA

For CLASS	See PATENT NO.
417–065	4,617,755
374–208	4,618,274
405–150	4,618,298
558–234	4,618,461

PATENTS

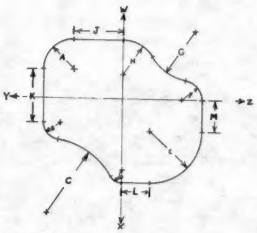
GRANTED OCTOBER 21, 1986

GENERAL AND MECHANICAL

4,617,684
PROTECTIVE PALM-PAD

Paul G. Green, P.O. Box 9554, Phoenix, Ariz. 85068, and Gregory C. Gayne, 4929 W. Hatcher Rd., Glendale, Ariz. 85302

Filed Sep. 16, 1981, Ser. No. 302,508
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—20 **6 Claims**



1. A protective palm pad for the purpose already described comprising: an oddly configured pad of two flexible components, having a leather facing and a backing of shock absorbent material, and two loops for securing the protective palm pad to the user's hand, and said leather facing exposed and worn in contact with the inside of the user's baseball mitt or glove, and said shock absorbent material backing pad worn in contact with the user's palm, and said two loops, one worn at the base of the user's forefinger and the larger one worn extended about the back of the user's hand, said loops positioning and securing the protective palm pad to the user's hand.

4,617,685
ORNAMENTAL BELT

Stanley Grandis, Forest Hills, N.Y., assignor to S. G. D' or Industries, Inc., Long Island City, N.Y.

Filed Apr. 8, 1985, Ser. No. 721,337
Int. Cl.[4] A41F *9/02*
U.S. Cl. 2—338 **4 Claims**

1. An ornamental belt to be worn about the waist, comprising an elongated elasticized fabric band that is expandable from an unexpanded position to a fully explanded position, in order to accommodate different waist sizes; a plurality of disc-like ornaments disposed about said fabric band in seriatim, each ornament having a curved outer surface and a substantially flat inner surface, said ornaments each overlapping, and being overlapped by adjacent ornaments when said band is in said unexpanded position, said ornaments lying flat upon said band in a spaced-apart relationship with respect to each other when said band is in said fully expanded position;

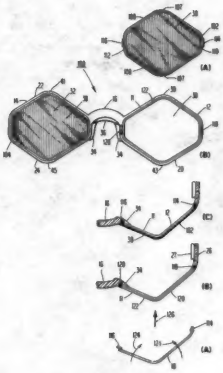
a pair of tabs disposed on said flat inner surface of each ornament, each pair of tabs hooking over opposite edges of said elasticized fabric band and providing that each ornament be contiguously affixed to said band in a flat spaced-apart relationship with respect to each other in said fully expanded position; and

a buckle device for buckling said band about said waist, comprising male and female clasp elements, said male clasp element affixed to one distal end of said band and said female clasp element affixed to an opposite distal end of said band, said male and female clasp elements engaging with each other to buckle said band about said waist.

4,617,686
PROTECTIVE EYEWEAR

Arthur G. Nahas, 593 Shore Rd., Somers Point, N.J. 08244

Filed Mar. 27, 1984, Ser. No. 593,732
Int. Cl.[4] A61F *9/02*
U.S. Cl. 2—433 **31 Claims**



1. Protective eyewear adapted for fitting onto a facial region of a wearer's head, said eyewear comprising:

(a) frame means including first and second frame portions having a nose piece connected therebetween, each frame portion having an upper segment and a lower segment defining a viewing aperture therebetween, said upper segment being upwardly inclined from horizontal by a predetermined amount along straight lines that extend from the side of the frame and from the nose piece to form an apex portion which outwardly extends from said facial region, said lines extending away from the wearer's facial region as they approach the apex portion, and said lower segment being downwardly inclined from horizontal by a predetermined amount to form an apex portion which outwardly extends from said facial region; and

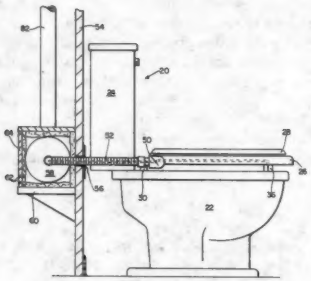
(b) at least two substantially straight filament members vertically extending under tension cross each said viewing aperture, said filament members having a predetermined diameter and a predetermined spacing therebetween.

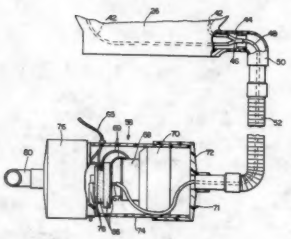
4,617,687

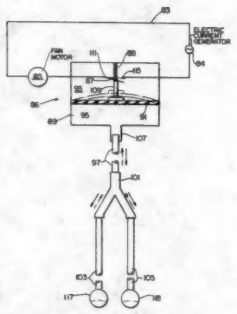
VENTILATED TOILET

Julian A. Wadsworth, R.R. 2, Box 84, Laurel Hill, Fla. 32567

Filed Sep. 24, 1984, Ser. No. 653,596
Int. Cl.[4] E03D *9/04*
U.S. Cl. 4—213 **30 Claims**







1. A ventilated toilet comprising:

(a) a toilet comprising a toilet bowl and a toilet seat, the toilet seat being mounted on the toilet above the toilet bowl;

(b) an electric exhaust fan assembly comprising an exhaust fan, an electric motor for driving the exhaust fan, and electric lead means for connecting the exhaust fan assembly to a source of electricity;

(c) a source of electricity for operating the said electric exhaust fan assembly, the said electric lead means being connected to said source of electricty to thereby provide an electric circuit and power for operating the said electric exhaust fan assembly including the said electric motor and thereby driving the exhaust fan;

(d) switching means for activating and deactivating said electric exhaust fan assembly comprising a switch positioned in said electric circuit which is normally biased to the open circuit position by biasing means which applies force thereto;

(e) means for operating said switching means whereby the said switch is moved from the normally open circuit position to the closed circuit position and thereafter allowed to return to the normally open circuit position, said operating means comprising first conduit means for carrying fluid under pressure, fluid pressurizing means for intermittently forcing fluid into said first conduit means, and means for applying force against said switch in a direction to overcome the force applied by said biasing means in response to fluid being forced under pressure into said first conduit means by said fulid pressurizing means whereby sufficient force is exerted against said switch to overcome the bias to the open circuit position and to thereby move the said switch to the closed circuit position and operate the said electric exhaust fan assembly, said means for applying pressure against the switch being rendered ineffective when the fluid pressurizing means is likewise rendered ineffective intermittently, said fluid pressurizing means including a plurality of spaced fluid pressurizing elements, said plurality of spaced fluid pressurizing elements collectively co-operating to intermittently force a variable volume of pressurized fluid into said first condiut means in response to the amount of pressure applied thereto during normal use of the toilet, said variable volume of pressurized fluid varying directly with the amount of said applied pressure and being at least sufficient to operate said switching means during normal use of the toilet, and siad plurality of fluid pressurizing elements being capable of collectively co-operating to intermittently force a substantially greater volume of pressurized fluid into said first conduit means than is normally required to operate said switching means upon the application of sufficient pressure thereto; and

(f) second conduit means for withdrawing gases from the interior of a toilet bowl and discharging the exhausted gases at a location remote therefrom, said second conduit means including a first end portion thereof in communication with the gases in the interior of the toilet bowl through which the said gases may be exhausted from the toilet bowl by the said electric exhaust fan assembly, and the said second conduit means also including a conduit portion in communication with the said electric exhaust fan assembly at a point remote from the first end portion whereby when the said switch is in the closed circuit position the electric exhaust fan assembly is activated and gases are exhausted from the toilet bowl, passed through the first end portion of the said second conduit means to the electric exhaust fan assembly and then discharges at a location remote from the toilet bowl.

4,617,688

TOILET HAVING ADJUSTABLE WATER-SPRAY NOZZLES

Dai-Ming Kuo, P. O. Box 10160, Taipei, Taiwan

Filed Sep. 25, 1985, Ser. No. 779,833
Int. Cl.[4] A47K *3/20*
U.S. Cl. 4—420.2 **1 Claim**

1. A toilet having a seat and adjustable water-spray nozzles comprising:

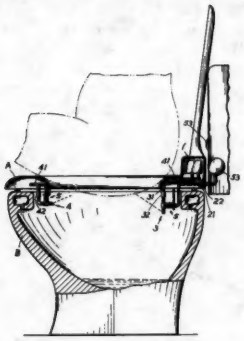
a warm water source;

two valves respectively controlling two branch water conduits directing water from said water source to a rear-side nozzle and a front side-nozzle said rear-side nozzle adapted for spraying the human anus, and having a flexible portion on said conduit and a water-spray hole with a fixed spraying angle in said conduit;

said front-side nozzle adapted for spraying the human genitals and having a flexible portion on said conduit and a water-spray hole with fixed spraying angle in said conduit;

a spraying-angle adjuster including a bellows having means for connecting to any one of said nozzles, an air tube fluidically connected with said bellows and secured to

said toilet seat by a bracket, and a hollow ball fluidically connected with said air tube, whereby when said ball is depressed said bellows will expand and cause movement of said nozzle about said flexible portion of said water conduit to optionally adjust the water-spraying angle of



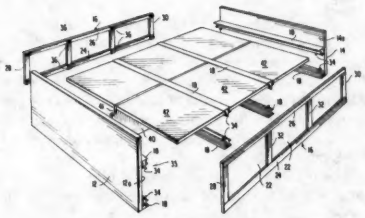
said nozzle for thoroughly cleaning either the human anus or genitals portions.

4,617,689

BED FRAME AND RELEASABLE COUPLING EMPLOYED THEREIN

Maynard A. Nelson, Bethel, Vt., and Kelly C. Gloger, Meriden, N.H., assignors to GN Alternatives, Bethel, Vt.

Filed Nov. 1, 1984, Ser. No. 667,302
Int. Cl.[4] A47C *19/00, 19/22;* B25G *3/18*
U.S. Cl. 5—400 **9 Claims**



1. A knockdown bed comprising:

opposed, longitudinally separated bed end boards,

laterally opposed bed sideboards,

a plurality of extruded U-shaped channel members at a length approximate the length of said end boards,

each of said U-shaped channel members fixedly mounting at opposite ends a detachable coupling latch assembly within said U-shaped channel members,

receiver assemblies sized and configured to fit within the ends of said U-shaped channel members fixedly mounted to at least the top of said sideboards at longitudinally spaced positions at uniform height from the bottom of the sideboards and forming at least one upper row of said receiver assemblies on each sideboard with said receiver assemblies of said rows being in diametrically opposite alignment,

one of said channel members being fixed along one side thereof to the respective facing sides of each of said bed end boards, at a vertical height corresponding to the position of the receiver assemblies on the bed sideboards;

said latch assemblies at said channel members each including means for direct self-coupling to diametrically opposite receiver assemblies on opposed sideboards respectively,

said channel members including means on each side thereof, defining open slots to each side thereof such that the open slots of adjacent channel members face each other, and

thin rectangular panels slidably inserted within facing slots of said channel members;

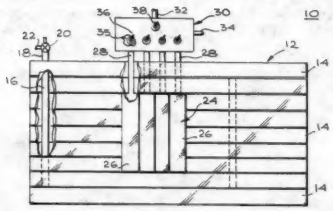
whereby, said thin rectangular panels and said channel members form a planar box spring and mattress support across the top of the bed longitudinally from one end bed end board to the other and laterally from one bed sideboard to the other and define a relatively rigid bed frame.

4,617,690

INFLATABLE BED PATIENT MATTRESS

Alfred H. Grebe, Richmond, Va., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed Jan. 7, 1985, Ser. No. 689,268
Int. Cl.[4] A61G *7/04;* A47C *27/10*
U.S. Cl. 5—453 **3 Claims**



1. An improved inflatable bed patient mattress, said mattress comprising, in combination:

(a) a hollow elongated air-inflated mattress body, at least the main portion of which is inflatable and deflatable as a single unit to a uniform pressure;

(b) a selectively air-inflatable patient support component disposed generally central of, totally surrounded by said mattress body and connected thereto, said support component being disposed at a location and being in a size to underlie those portions of a patient's body, when lying on said mattress body, which extend from about the lumbar spinal region to the upper thigh region; said patient support component including a plurality of individually air inflatable cells; and,

(c) support component inflation means individually connected to each of said cells for both manually controlling selective powered air inflation and deflation of said cells to individual pressures and for automatic cycling of powered inflation and deflation of said cells to individual pressures to facilitate patient body support and minimize development of decubitis ulcers.

4,617,691

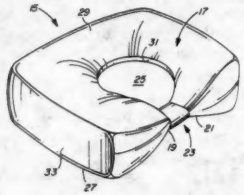
SUPPORT PILLOW

Martha S. Monti, and Gilbert L. Monti, both of P.O. Box 9428, Phoenix, Ariz. 85068

Continuation of Ser. No. 487,989, Apr. 25, 1983, abandoned. This application Jun. 19, 1985, Ser. No. 746,451
Int. Cl.[4] A47G *9/00;* A61H *1/02*
U.S. Cl. 5—434 **1 Claim**

1. A pillow adapted to encircle a user's neck while resting on the user's shoulders, said pillow comprising an elongated segment with a substantially homogeneous filling forming a pillow of generally rectangular shape in top plan view, with a circular opening therein, and including an inner vertical surface having a first generally constant thickness, for fitting substantially around the user's neck and an outer peripheral vertical edge surface having a second generally constant thickness, said outer peripheral edge surface being spaced substantially laterally apart from said inner surface and said second thickness being substantially greater than said first thickness for provid-

ing a wedge shaped support pillow that provides improved lateral support around the user's neck and head; and tear fastener means located at the end portions of the elongated segment forming said pillow, said fastener means adapted to selectively adjust the fastened positions to insure user comfort and



adapted to produce a tighter fit if greater head support is desired, said pillow providing increased support for the back of user's neck whenever said tear fastener means is positioned in front of the user and under his chin and said pillow providing increased support for the user's chin and head whenever said tear fastener means is positioned in the back of the user's neck.

4,617,692

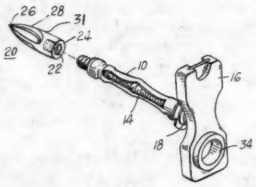
TOOL FOR DRILLING AND SECURING SCREW ANCHOR TO A WALL

Michael E. Bond, Topton, and Robert S. Noll, Reading, both of Pa., assignors to Emhart Corporation, Farmington, Conn.

Filed Dec. 30, 1983, Ser. No. 567,255

Int. Cl.[4] B26B *11/00*; F16B *13/04*

U.S. Cl. 7—158 **5 Claims**



1. A tool for preparing a hole in a wall for receipt of a screw anchor that is to be secured to the wall by the same tool, said tool comprising:

a handle with a threaded stem extending therefrom, said threaded stem having a length sufficient to allow a screw anchor to be threadably mounted thereon whereby at least two threads of the threaded stem are exposed beyond the end of the thus mounted screw anchor; and

an integrally formed drill tip having a point and a tapered drilling length extending back from said point, said integrally formed drill tip furthermore having a tapped hole extending along the central axis of the drill tip, said tapped hole having threads therein which match the exposed threads on said threaded stem, said tapped hole furthermore being of sufficient depth so as to allow said drill tip to abut the end of a screw anchor threadably mounted on said threaded stem when said drill tip is threaded onto the exposed threads of said threaded stem, the abutment only being maintained when the drill tip is rotated in a drilling direction so as to drill a hole into a wall structure so as to form a hole for the screw anchor.

4,617,693

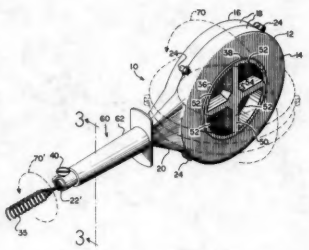
DRAIN PIPE CLEANING TOOL

Marjorie A. Meyer, 19711 NE. 21 Ct., North Miami Beach, Fla. 33179, and John D. Moore, 2685 NE. 188 St., North Miami Beach, Fla. 33180

Continuation-in-part of Ser. No. 637,805, Aug. 6, 1984, abandoned. This application Oct. 3, 1985, Ser. No. 783,510

Int. Cl.[4] B08B *9/02*

U.S. Cl. 15—104.3 SN **18 Claims**



1. A drain cleaning assembly of the type including a coil structure extendable axially along a length of the drain being cleaned and rotatable therein, said assembly comprising:

(a) a housing comprising an at least partially hollow interior and including two spaced apart lateral faces disposed in substantially parallel relation to one another and a continuous substantially cylindrical peripheral surface connected between said lateral faces and defining a peripheral boundary thereof,

(b) an elongated barrel structure mounted on said housing and secured to and extending outwardly from said peripheral surface in a direction substantially parallel to said lateral faces,

(c) a drum mounted on said housing interior and being rotatable about its own central axis and including a support surface formed about an outer periphery of said drum,

(d) said drum having at least one end portion thereof being physically accessible on one of said lateral faces, said end portion rotatable with a remaining portion of said drum, whereby rotation of said end portion causes rotation of said drum,

(e) a cleaning cable having an elongated configuration and formed of flexible material having one end secured on the interior of said housing, said cable movable between a stored position and an operable position,

(f) said stored position defined by said cable being wound on said drum about said support surface on said housing interior, and said operable position being defined by a length of said cable adjacent a free end thereof extending outwardly from a free end of said barrel structure,

(g) handle means for holding said assembly and being connected to said housing and structured to allow relative movement between said housing and said handle means,

(h) said cable rotatable along its length upon rotation of said housing relative to said handle means and movable between said stored and said operable positions upon rotation of said drum relative to said housing.

4,617,694

FINGER-MOUNTED DEVICE FOR CLEANING TEETH

Jacques Bori, Watertown, Mass., assignor to Team, Inc., Newton, Mass.

Filed Sep. 21, 1984, Ser. No. 652,844

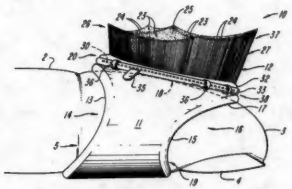
Int. Cl.[4] A46B *9/04*

U.S. Cl. 15—167 R **11 Claims**

1. An improved finger-mounted device for cleaning teeth of the type having holder means for engaging a single finger and

teeth cleaning means mounted on said holder means, wherein the improvement comprises:

said holder means being tubular and capable of enclosing a single finger, and said teeth cleaning means having a cleaning surface comprising a plurality of concave surfaces joined along raised inner edges and bounded by



raised outer edges, each of said concave surfaces being adapted to clean a complementary shaped convex tooth surface and at least pairs of said raised outer edges meeting at raised points located at spaced intervals along the perimeter of said cleaning surface and being adapted to clean the tooth edges.

4,617,695

TOOTHBRUSH

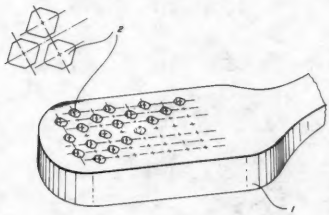
Walter Amos, Wiesbaden, and Horst Klein, Kelkheim-Fischbach, both of Fed. Rep. of Germany, assignors to Blendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 699,341

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1984, 3404150

Int. Cl.[4] A46B *9/04*

U.S. Cl. 15—195 **2 Claims**



1. A toothbrush having a brush handle and a brush head with a flat surface area, said brush head being provided with a plurality of openings to receive bristle bundles therein, the improvement comprising:

a plurality of openings each in the shape of a hexagon having parallel elongated sides and rounded opposing ends;

said plurality of openings further being of a substantially uniform depth for receiving said bristle bundles.

4,617,696

SCRAPER AND SCRUBBER FOR FRUITS, VEGETABLES AND THE HUMAN BODY

Frank Meta, P.O. Box 116, Irvington, N.J. 07111

Continuation-in-part of Ser. No. 723,299, Apr. 15, 1985, which is a continuation-in-part of Ser. No. 519,104, Aug. 1, 1983, abandoned. This application Jul. 19, 1985, Ser. No. 757,042

Int. Cl.[4] A61H *37/00*; A23N *7/00*

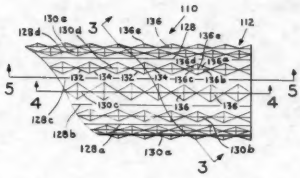
U.S. Cl. 15—236 R **8 Claims**

1. A scraper and scrubber, comprising:

an elongated cylindrical body having an outer surface;

a plurality of parallel, circumferentially spaced channels having a first depth extending in the longitudinal direction on said outer surface to form a plurality of parallel, circumferentially spaced ridges extending in the longitudinal direction on said outer surface between adjacent channels;

a plurality of substantially V-shaped helical grooves having a second, smaller depth extending at an acute angle to said



channels and intersecting said ridges to form sharp, substantially pyramid shaped structures on said ridges, said substantially pyramid shaped structures situated on each ridge being offset with respect to said substantially pyramid shaped structures situated on adjacent ridges.

4,617,697

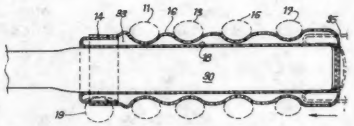
MOLDABLE HANDLE ADAPTER

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Filed Aug. 1, 1985, Ser. No. 761,352

Int. Cl.[4] A63B *49/00, 53/14*; B25G *1/10*

U.S. Cl. 16—110 R **8 Claims**



1. In combination,

a handle; and

an adapter surrounding a portion of the handle and configured to fit a user's grip, including a pair of elongate pouches each having a flexible deformable wall defining a closed end and an open end, means for joining the open ends of the pouches in overlapping relationship, one of the pouches being folded inside the other one of the pouches, the inside pouch being in intimate contact with the handle portion and there being defined an internal volume between the walls of the pouches which surrounds the handle portion, the volume being filled with a material which was initially moldable by gripping the outside pouch and which thereafter hardened to provide the adapter with a plurality of deformations for receiving the fingers and thumb of the user's hand.

4,617,698

SPRING-BIASED HINGE ASSEMBLY FOR SPECTACLES

Günther Drlik, Pforzheim, Fed. Rep. of Germany, assignor to Obe-Werk Ohnmacht & Baumgartner GmbH & Co. K.G., Ispringen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 478,709, Mar. 25, 1983, abandoned. This application May 28, 1985, Ser. No. 738,495

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1982, 3213174; Dec. 10, 1982, 3245797

Int. Cl.[4] G02C *5/16, 5/22*

U.S. Cl. 16—228 **7 Claims**

1. A hinge assembly for a pair of spectacles, comprising:

a mid-portion-side hinge element having a portion attachable

to said spectacles, said hinge element having a pair of spaced-apart hinge eyes;

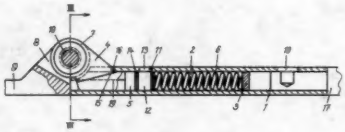
a flat tubular element having a longitudinal cavity provided with an open end;

a tongue slidably supported in said cavity, said tongue having an end extending out of said cavity and terminating in a bow-side hinge element having a hinge eye, said tongue having an internal slot extending longitudinally across a pair of wall surfaces;

means for pivotally interconnecting said bow-side and mid-portion-side hinge elements together;

cam means adjoining the open end of said flat tubular element;

cam means associated with at least one of said hinge elements;



a spring disposed in said slot for opposing the movement of said tongue out of said cavity;

a spring abutment extending transversely through said slot in said tongue and positioned in said slot;

a pin extending through said spring abutment, said bow-side hinge element and one end of said flat tubular element defining a mounting tunnel to accommodate the movement of said bow-side hinge element; and

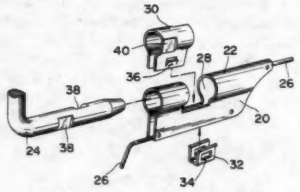
means on said flat tubular element for immobilizing said pin in a predetermined position on said flat tubular element, whereby, when said spring is placed during assembly under compression, said spring will force the cam means on said flat tubular element against the cam means on at least one of said hinge elements.

4,617,699

HINGE STRUCTURE FOR A SUN VISOR OR THE LIKE WHICH FEATURES A SINGLE STORAGE POSITION SNAP ACTION FUNCTION

Haruo Nakamura, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama and Kasai Kogyo Co., Ltd., Tokyo, both of, Japan

Filed Jun. 15, 1982, Ser. No. 388,608
Claims priority, application Japan, Jun. 19, 1981, 56-90579[U]
Int. Cl.⁴ E05D *11/08*
U.S. Cl. 16—262 **4 Claims**



1. A hinge, comprising:

a shaft having a generally circular cross-section;

a member rotatably supported on said shaft;

indentations defining first and second flat surfaces on said shaft formed along chords of said circular cross-section, said first and second flat surfaces being formed on said shaft at longitudinally staggered positions and on opposite sides of said shaft; and

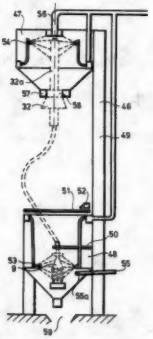
spring means connected to said member for engaging said shaft and for resisting rotation of said member about said shaft, said spring means having resilient first and second flat portions positioned on opposite sides at staggered positions along said spring means for engaging said first and second flat surfaces, respectively, when said member assumes a predetermined angular position with respect to said shaft.

4,617,700

PROCESS AND APPARATUS FOR THE HYGIENIC EXTRACTION AND COLLECTION OF ANIMAL BLOOD FIT AND UNFIT FOR HUMAN CONSUMPTION

Géza Bátorfalvi, Budapest; Tibor Lendvai, Baja; Antal Rádai, Baja; Gáborné Pongrác, Baja; Miklós Szabó, and Jenö Szilárdi, both of Budapest, all of Hungary, assignors to Országos Husipari Kutatóintézet, Budapest and Bácskai Husipari Közös Vállalat, Baja, both of, Hungary

Filed Feb. 24, 1984, Ser. No. 583,506
Claims priority, application Hungary, Mar. 14, 1983, 853/83
Int. Cl.⁴ A22B *3/00*
U.S. Cl. 17—45 **8 Claims**



1. An apparatus for the hygienic extraction and separate collection of animal blood which is fit and unfit for consumption, comprising: an intermittently rotatable turntable for moving tanks into an extracting position, first and second draining positions and a washing position; numbering means for identifying each carcass and its blood; a hollow knife with a ribbed stabbing part made of a single piece; a plurality of tanks uniformly spaced along its periphery of the turntable with each having a hose cock on a lower part for draining and couplings on an upper part for the input of blood, a vacuum and an anticoagulant; a hose connecting the knife to the coupling of a tank on the extracting position; a storage system for blood fit for consumption connectable to the hose cock on the bottom of a tank in the first draining position on the turntable; a collecting system for blood unfit for consumption connectable to the hose cock on the bottom of a tank in the second draining position; a tank-washing unit arranged above a tank in the washing position; a knife washing apparatus for washing and disinfecting the hollow knife and hose; and an animal hygienic control body for opening the hose cock of a tank of the first draining position if the numbered carcasses corresponding to the blood in the tank are healthy.

4,617,701

METHOD OF DISPENSING A DEFORMABLE AND FLOWABLE FILLING MATERIAL

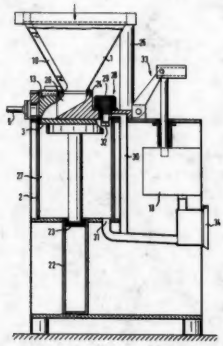
Albert Frey, Herbrechtingen, Fed. Rep. of Germany, assignor to Firma Heinrich Frey, Herbrechtingen, Fed. Rep. of Germany

Filed May 24, 1984, Ser. No. 613,909

Claims priority, application Fed. Rep. of Germany, May 26, 1983, 3319139; Feb. 23, 1984, 3406605

Int. Cl.[4] A22C *11/06*

U.S. Cl. 17—45 8 Claims



1. In a method of dispensing a deformable and flowable filling material, in particular sausage meat, wherein the filling material is first introduced into a filling funnel, and the filling material is then transferred into a filling cylinder at a reduced pressure, and the connection between the funnel and the inner chamber of the cylinder is then interrupted, and wherein the filling material is then exposed to increased pressure by reducing the size of a dispensing cylinder and is expelled in defined manner via a dispensing tube, the improvement wherein the transfer of the filling material from the filling funnel into the filling cylinder is effected by a predetermined pressure difference between the chamber of the filling funnel and the chamber of the filling cylinder and wherein prior to said transfer a predetermined reduced pressure is provided in the chamber of the filling funnel and the filling material is transferred while reduced pressure prevails in the chamber of the filling funnel during stirring thereof to move the filling material towards the center of the filling funnel during the transfer of the filling material from the filling funnel into the filling cylinder.

4,617,702

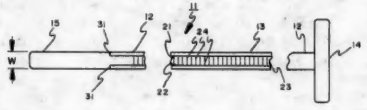
TIE MOUNT

Paul W. Diederich, Jr., 633 Hunters Trail, Glendora, Calif. 91740

Filed Jan. 22, 1985, Ser. No. 693,098

Int. Cl.[4] B65D *63/10*

U.S. Cl. 24—16 PB 3 Claims



1. A tie mount adapted for use with a slidable, apertured disk retainer comprising in combination:

(a) an elongated, semi-rigid shaft member having a central, U-shaped cross-sectional portion;

(b) a disk-shaped head member integrally formed at one end of said elongated shaft member, said disk-shaped head member lying in a plane substantially perpendicular to the longitudinal axis of said elongated shaft member;

(c) a thin, rectangular tip portion integrally formed at the other end of said elongated shaft member, the central U-shaped cross-sectional portion of said elongated shaft member being situated between said disk-shaped head member and said thin, rectangular tip portion, the central U-shaped cross-sectional portion having upwardly extending side walls and a bottom trough;

(d) a longitudinally extending array of transvese serrated teeth integrally formed upon the bottom trough of and extending between the side walls of the central, U-shaped cross-sectional portion, the tips of said longitudinally extending array of teeth projecting upward from the bottom trough and terminating at a position approximately midway up the side walls of the central, U-shaped cross-sectional portion; and

(e) stop means situated at the junction of said thin, rectangular tip portion and the central, U-shaped cross-sectional portion of said elongated shaft member, said stop means being defined as a plane substantially perpendicular to the longitudinal axis of said elongated shaft member as formed by the end of the upwardly extending side walls of the central, U-shaped cross-sectional portion.

4,617,703

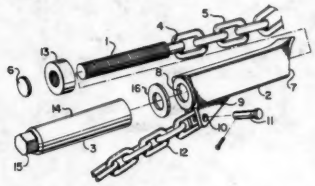
DEVICE FOR TIGHTENING CHAINS AND THE LIKE

Richard J. Schaeffer, 10981 Westview Pl., Delta, British Columbia, Canada (V4E 2L9)

Filed Oct. 11, 1984, Ser. No. 659,969

Int. Cl.[4] B25G *3/00*

U.S. Cl. 24—68 CT 7 Claims



1. A device for tightening chains, straps, ropes or cable comprising:

(a) an elongated, threaded element adapted to be secured at one end thereof to a first end of a chain, strap, rope or cable;

(b) a hollow sleeve element open at one end and having at the opposite end an aperture adapted to allow the passage of said elongated threaded element, wherein said sleeve element is configured to prevent rotation of said chain, strap, rope or cable;

(c) means for securing said sleeve element to a second end of a chain, strap, rope or cable; and

(d) a hollow, tubular member adapted at a first end thereof to threadably receive said threaded element and bear against the exterior of said second end of said sleeve element whereby rotation of said means for threadably receiving causes said threaded element to be drawn through said opening in said sleeve element thereby tightening said chain or chains, strap or straps, rope or ropes, or, cable or cables, and wherein said tubular member further comprises means for applying a tool at a second end thereof in order to rotate said tubular member.

4,617,704

SWIVEL SNAP HOOK OF SYNTHETIC RESIN

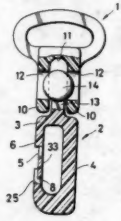
Kazumi Kasai, Namerikawa, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1985, Ser. No. 722,476

Claims priority, application Japan, Apr. 12, 1984, 59-54032[U]

Int. Cl.⁴ A44B *13/02*

U.S. Cl. 24—236 **12 Claims**



1. A swivel snap hook of synthetic resin, comprising:

(a) an eye member; and

(b) a unitary hook member pivotally connected to said eye member, said hook member having a base, a hook body extending from one side of said base, and a planar closure tongue extending freely from said one side of said base so as to normally substantially close said hook body, said closure tongue being resiliently deformable to open said hook body, said closure tongue lying in the general plane of a free end portion of said hook body and having a first end surface which, as said closure tongue is in a free form, faces a second end surface of said hook body in a non-engaging closely spaced relation.

4,617,705

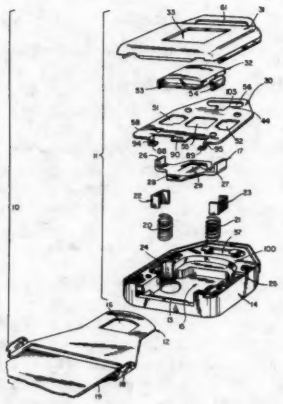
CHILD BELT BUCKLE

James R. Anthony, and Allan R. Lortz, both of Carmel, Ind., assignors to Indiana Mills & Manufacturing, Inc., Carmel, Ind.

Filed Aug. 5, 1985, Ser. No. 762,451

Int. Cl.⁴ A44B *11/26*

U.S. Cl. 24—642 **24 Claims**



1. A buckle comprising:

a reinforcement plate having a longitudinal axis extending through a longitudinal plane and further having legs with distal ends;

a main body having said plate mounted thereto and including stop surfaces receiving said distal ends and the load therefrom while limiting relative movement between said plate and main body, said main body includes yieldable means integral therewith for engaging said plate, said yieldable means being moveable to allow said plate to be inserted in said main body and then moveable back holding said plate therein;

a latch positioned in said main body and held captive therein by said plate, said latch moveable between a latch position and an unlatched position;

spring means contacting said latch to move said latch back and forth between said latch position and said unlatched position;

operator means operable to move said latch to said unlatched position; and

a cover mounted to said main body and cooperatively forming a mouth therewith, said plate extending across and atop said mouth adjacent said cover which encloses said latch, said spring means and said plate, said cover including securing means extending between said plate and said main body securing said cover to said main body.

4,617,706

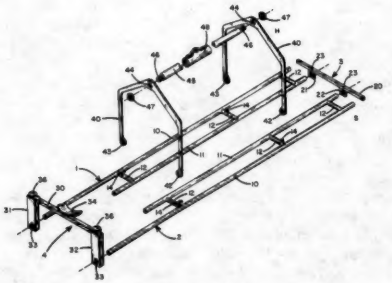
DEVICE FOR MANIPULATING CADAVERS

Wallace Waletzko, Box 180, Avon, Minn. 56310

Filed Jul. 29, 1985, Ser. No. 759,863

Int. Cl.⁴ A61G *1/00, 7/10, 19/00*

U.S. Cl. 27—28 **3 Claims**



1. An apparatus for manipulating cadavers including support means for supporting the cadaver during movement and manipulation and harness means which cooperate with said support means wherein said support means include:

(a) a first side rail assembly for supporting from beneath one side of said cadaver said side rail assembly being comprised of an outside longitudinal bar and a shorter inside longitudinal bar joined together by a plurality of support bars;

(b) a second side rail assembly for supporting from beneath the other side of said cadaver, said second side rail assembly also being comprised of an outside longitudinal bar and a shorter inside longitudinal bar joined together by a plurality of support bars;

(c) a foot rail assembly for supporting the feet of the cadaver comprised of a bar, said bar being long enough for its bottom to engage the outside longitudinal bars of the first and second side rail assemblies, and having a first projection extending therefrom associated with the inside longitudinal bar of the first side rail assembly and a second projection extending therefrom associated with the inside longitudinal bar of the second side rail assembly, each such projection having an annular bore slidably receiving

and retaining in assembled relation one end of the inside longitudinal bar of the side rail assembly associated therewith;

(d) a head rail assembly comprised of a bar having cup means associated therewith for supporting the cadaver's head, a first projection extending therefrom associated with the first side rail assembly and the second projection extending therefrom associated with the second side rail assembly, each such projection having an annular bore for slidably receiving and retaining in assembled relation the other end of the outside longitudinal bar of the side rail assembly associated therewith; and

(e) means for locking said head rail assembly in place with respect to said side rail assemblies.

4,617,707

METHOD FOR THE MANUFACTURE OF AN ULTRASONICS ANTENNA ARRAY

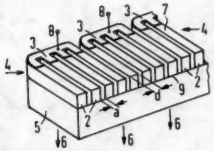
Jutta Mohaupt, Munich; Karl Lubitz, Ottobrunn; Manfred Schnoeller, Haimhausen, and Wolfram Wersing, Kirchheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 9, 1985, Ser. No. 773,877

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1984, 3435569

Int. Cl.[4] H01L *41/22*

U.S. Cl. 29—25.35 **8 Claims**



1. A method for the manufacture of an ultrasonic antenna array composed of a juxtaposed arrangement of piezoceramic transducer elements comprising:

providing a laminate of alternating layers of unsintered ceramic and spacing layers, said spacing layers being composed of a filler material which is heat fugitive at the sintering temperature of said ceramic, said spacing material also including refractory grains distributed therein of a size which corresponds to the spacing desired between the ceramic layers,

sintering said laminate to thereby liberate said filler material and leave voids between said refractory grains,

impregnating the resulting laminate with a polymerizable resin to bond the sintered ceramic layers together, and

separating the resulting laminate into individual transducer elements.

4,617,708

COMPONENT MODULE FOR PIGGYBACK MOUNTING ON A CIRCUIT PACKAGE HAVING DUAL-IN-LINE LEADS, AND METHODS OF FABRICATING SAME

William J. Fanning, Glen Ellyn, Ill., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Division of Ser. No. 452,662, Dec. 23, 1982, Pat. No. 4,521,828. This application Apr. 2, 1985, Ser. No. 704,700

Int. Cl.[4] H01G *7/00*

U.S. Cl. 29—25.42 **4 Claims**

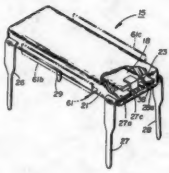
1. A method of fabricating a component module for piggyback mounting on, and interconnection with, an integrated circuit package of the type having dual-in-line leads, said method comprising the steps of:

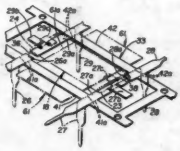
partially blanking at least first and second oppositely directed and longitudinally spaced terminals out of an elongated strip stock carrier, each of said terminals including a first outwardly disposed leg portion, a second inwardly disposed leg portion, and at least a third leg portion that extends perpendicularly to said second leg portion;

forming the third leg portion of each of said terminals into a contact member for electrically engaging opposite end electrodes of a component and for providing temporary support for such a component;

positioning the body portion of the component between the second leg portions of said terminals such that said component is supported by, and its opposite end electrodes are respectively biased against, the contact members of said terminals;

completely serving said first and second terminals from said strip stock carrier, while clamping at least the outermost





ends of the first leg portions of said terminals such that they remain in a common plane;

encapsulating said component, including its electrodes and said terminal contact members, within a molded housing with at least a major part of the second leg portion of each terminal embedded in said housing; and

bending the first leg portions of said terminals downwardly from respective regions adjacent to two diagonally disposed corners of said housing, the resulting spacing between the first leg portions of said first and second terminals being selected so that said terminals will respectively contact selected correspondingly disposed leads of an associated integrated circuit package, having dual-in-line leads, when said fabricated component module is subsequently piggyback-mounted thereon.

4,617,709

SEGMENTAL SHELL FOR A COAL CRUSHER ROLL INCLUDING SPECIALIZED REMOVAL MEANS

Theodore F. Gundlach, Belleville, Ill., assignor to T. J. Gundlach Machine Company, Belleville, Ill.

Filed Mar. 5, 1984, Ser. No. 586,571

Int. Cl.[4] B21B *27/00*

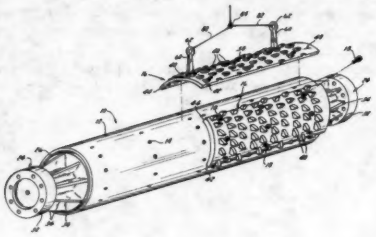
U.S. Cl. 29—124 **10 Claims**

1. In a coal crusher having a cylindrical back-up roll having two ends, an outside face, a longitudinal axis, and a hub mounted in each end of said back-up roll; a combination of a plurality of removable toothed segments mounted to said outside face of said roll and hook means including a tang for removing said segments from said roll comprising

a plurality of metal segments, each of said segments in the form of a sector of a tube, said segment having an inside face and an outside face and an outside peripheral edge, said edge including upper and lower axially extending edges, and two circumferential edges, the inside face of said segment having a radius of curvature substantially equal to the radius of curvature of the outside face of said

back-up roll and having a plurality of counterbored holes therein for receiving headed bolts which are threaded into tapped holes in said back-up roll to secure said segments to said back-up roll, each of said counterbored holes having a seat to receive said heads of said bolts;

said members designed to be mounted to said back-up roll in a plurality of circumferentially arranged, axially extending, adjacent rows on said outside surface of said roll;



a rabbet at the opening of at least two of said holes on the inside face of said segment, each of said rabbets having an upper surface and formed by a counterbore, said counterbore forming a shoulder which can be engaged by said tang of said hook means; and

said hook means designed to be releasably inserted into said rabbetized holes so that when a lifting force is exerted on said hook means, said hook means becomes locked into said rabbet to permit the safe removal and replacement of said member on said back-up roll.

4,617,710

INSULATOR REMOVAL TOOL

Ernest J. Kotnik, Northwood, Ohio, assignor to AP Industries, Inc., Toledo, Ohio

Filed May 29, 1985, Ser. No. 738,767
Int. Cl.[4] B25B *27/00*
U.S. Cl. 29—268 **10 Claims**

1. A tool for forcing an enlarged head of a vehicular exhaust system mounting stud from a vehicular exhaust system rubber insulator, said tool comprising:

en elongated driver having a driving shaft at one end thereof; and

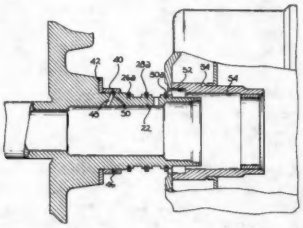
an elongated support having opposed ends, one said end of said support being pivotally mounted to said driver at a location thereon spaced from the driving shaft such that the other said end of said support is rotatable toward and away from the driving shaft, the other end of said support including a pair of spaced apart arms, each said arm defining a first supporting surface and a pair of spaced apart second supporting surfaces, said supporting surfaces being on the sides of said arms nearest the driving shaft, the first supporting surface of each said arm being disposed intermediate the spaced apart second supporting surfaces thereof, said first supporting surfaces lying in a first plane and said second supporting surfaces lying in a second plane angularly aligned with respect to the first plane, said first and second supporting surfaces being aligned such that when said support is rotated away from said driving shaft the first surfaces of said arms are approximately perpendicular to said driving shaft and such that when said support is rotated toward the driving shaft the second surfaces of said supporting arms are generally perpendicular to said driving shaft.

4,617,711

METHOD AND APPARATUS FOR REPAIRING AUTOMATIC TRANSMISSIONS

William D. McMinn, 42215 52nd St. W., Quartz Hill, Calif. 93534

Filed Sep. 26, 1983, Ser. No. 535,590
Int. Cl.[4] B23P *7/00;* **B60K** *17/00*
U.S. Cl. 29—402.08 **14 Claims**



1. In the repair of an automotive transmission having a direct clutch assembly supported at the front thereof by a front direct clutch bushing pressed into the front of the direct clutch housing and riding on a journal on the pump cover shaft, the pump cover shaft having a plurality of plastic seal rings in spaced apart grooves in the shaft for sealing engagement with an inside diameter of the direct clutch housing hub, the inside diameter of the direct clutch housing hub being sufficiently larger than the front direct clutch bushing so as to preclude the reliable passage of metal seal rings therethrough without cracking, breaking or permanently bending the same, the steps of

(a) removing the front direct clutch bushing from the front of the direct clutch housing;

(b) removing the plastic seal rings from the pump cover shaft;

(c) installing a replacement bushing on the journal on the pump cover shaft to at least in part act as a journal bearing in cooperation with the front of the direct clutch housing from which the front direct clutch bushing was removed;

(d) installing metal seal rings in the grooves in the pump cover shaft; and

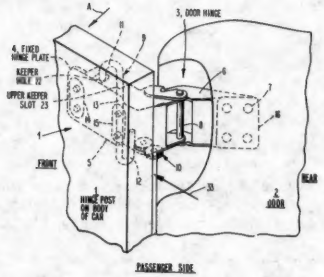
(e) assembling the direct clutch housing onto the pump cover shaft.

4,617,712

METHOD FOR REPLACING CORVETTE DOOR HINGE SPRING

James T. Streett, Pottstown, Pa., assignor to Street Specialty Products Inc, Pottstown, Pa.

Filed May 2, 1983, Ser. No. 490,433
Int. Cl.[4] B23P *7/00, 7/04*
U.S. Cl. 29—402.08 4 Claims



1. The method of replacing a broken door hinge spring on a Corvette motor car:

providing a Corvette motor car having a body and a door and a door hinge including a fixed hinge plate mounted on the car body, a moveable hinge plate mounted on the car door with the hinge plates being connected by a pivot pin, a broken hinge spring on the fixed hinge plate, cam means on the moveable hinge plate, the fixed hinge plate having upper and lower flanges with the upper flange having a keeper hole and an upper keeper slot and with the lower flange having a lower keeper slot in vertical alignment with the upper keeper slot and the lower flange also having a rear keeper slot the outboard end of which is off-set inwardly from the upper and lower keeper slots;

removing said broken spring;

providing a cam follower spring having an upper bent section, a lower bent section and a mid-section therebetween together with a keeper slot in the upper bent section;

placing the door in an open position;

with the upper bent section facing the front of the car, manipulating the spring to insert the upper bent section into the keeper hole and into the upper keeper slot and to insert the mid-section into the lower keeper slot;

inserting a tool inside the lower bent section and rotating the tool toward the center of the car to twist the midsection and cause said tip to be vertically aligned with the rear keeper slot;

while holding the tool so that the tip remains in said aligned condition, tapping the lower bent section with a hammer to cause the spring to move vertically until the tip is received within the rear keeper slot and the keeper slot in the upper bent section receives the side of the keeper hole and the lower bent section is positioned to engage the cam means when the tool is released; and

releasing and removing said tool.

4,617,713

NURSERY POT CUTTING TOOL

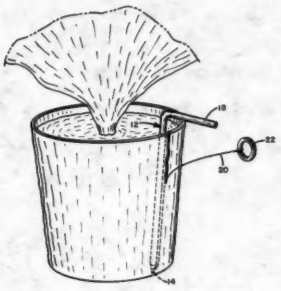
David E. Pomerenke, Shakopee, Minn., assignor to Creative Landscape Service, Inc., Shakopee, Minn.

Filed Jul. 15, 1985, Ser. No. 754,758
Int. Cl.[4] B23P *19/02*
U.S. Cl. 29—426.4 1 Claim

1. The method of removing a temporary fiber growing pot from nursery stock prior to planting, comprising:

(a) inserting an elongated, rigid rod having a flexible strand secured to the lower end thereof downward into the soil next to the sidewall of said pot;

(b) pulling outward and downward on said strand while



holding said rod in position with sufficient force to cause said strand to cut through said sidewall; and

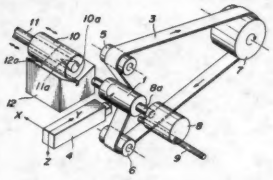
(c) spreading and removing the cut pot from around the root ball of said nursery stock.

4,617,714

PROCESS AND APPARATUS FOR FINISHING A GUIDE ROLLER

Takuaki Kori, Kanagawa; Hirotaka Ozawa, and Shiro Sugawara, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 6, 1985, Ser. No. 741,796
Claims priority, application Japan, Jun. 14, 1984, 59-127704
Int. Cl.[4] B23P *19/00;* B21D *53/00;* B21B *27/00;* B23B *3/00*
U.S. Cl. 29—434 13 Claims



1. A process for finishing a guide roller comprising the steps of:

forming a pre-assembly of a guide roller and a bearing;

rotatably supporting said pre-assembly;

driving said pre-assembly to rotate about a stationary axis by means of a driving belt; and

machining the outer surface of said pre-assembly to a predetermined radius by means of a machining bit in contact with said assembly at a point diametrically opposite to the point of contact between said belt and said assembly.

9. An apparatus for finishing the surface of a guide roller having a central bore accommodating at least one element chosen from the group comprising bearings and lubricating elements, comprising:

a shaft passing through the guide roller and through bearings received within the central bore of the guide roller;

a drive belt in frictional engagement with the guide roller at a known belt pressure;

means driving said drive belt to rotate, thereby driving the guide roller to rotate about said shaft; and

a cutting bit for machining the surface of the guide roller to a desired radius, said cutting bit being brought into contact with the surface of the guide roller at a given bit pressure less than said belt pressure and at a point diamet-

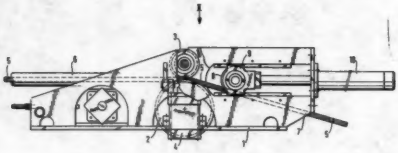
rically opposite the point of contact between said belt and the guide roller.

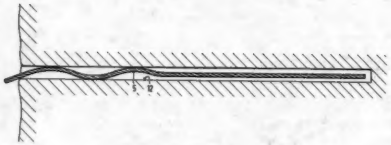
4,617,715

METHOD FOR PRELIMINARY ANCHORING OF A WIRE ROPE BOLT

Pauli A. T. Koistinen, and Risto J. Hämäläinen, both of Joensuu, Finland, assignors to OY Tampella AB, Tampere, Finland

Filed Jul. 21, 1983, Ser. No. 515,592
Claims priority, application Finland, Aug. 3, 1982, 822707
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—456 **7 Claims**





1. A method of preliminarily anchoring a plural strand metal wire rope bolt in a bore prior to and to facilitate permanent anchoring comprising in a continuous operation the steps of:

(a) feeding and permanently deforming the wire rope to be anchored by bending the same to form at least one arched portion therein; and

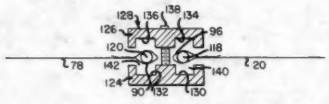
(b) progressively feeding the arched portion into the bore so that the arched portion of the wire rope frictionally presses against the wall of the bore.

4,617,716

METHOD OF JOINING EDGES OF TWO ELONGATED WEBS

Khin M. Lay, Gardena; Stephen E. Palguta, Redondo Beach; Ramon B. Fernandez, Torrance, and Santiago C. Cabalquinto, Lawndale, all of Calif., assignors to Hitco, Newport Beach, Calif.

Division of Ser. No. 483,922, Apr. 11, 1983, Pat. No. 4,501,037.
This application Nov. 13, 1984, Ser. No. 670,565
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—526 R **3 Claims**



3. A method of joining the edges of two elongated webs comprising the steps of:

forming a loop along the edge of each of the webs;

inserting a different one of a pair of elongated elements into the loop formed in the edge of each of the webs;

providing an elongated splice bar comprised of opposite halves forming at least one slot therebetween along the length thereof; and

inserting the edges of the webs including the elongated elements inserted therein into the at least one slot formed between the opposite halves of the splice bar;

the step of forming a loop along the edge of each of the webs including the steps of:

applying at least one length of tape to the edge of each of the webs;

stitching the taped edge of each of the webs along the length thereof; and

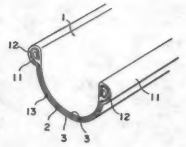
folding the taped edge of each of the webs over on itself to form an elongated element-receiving loop along the edge of the web.

4,617,717

COMPOSITE MEMBER COMPRISING METALLIC SHEET BENT TO BE ARCUATE IN SECTION AND RIGID SYNTHETIC RESIN COATING

Hideomi Yamamoto; Haruzo Watanabe, both of Shiga; Hidehiko Kishie, Shijonawate, and Toshio Nishihara, Shiga, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Continuation of Ser. No. 479,652, Mar. 28, 1983, abandoned.
This application Jul. 29, 1985, Ser. No. 759,914
Claims priority, application Japan, Mar. 31, 1981, 56-48768
Int. Cl.[4] B22D *11/126*
U.S. Cl. 29—527.4 **3 Claims**



1. A method for manufacturing a composite member comprising a metallic sheet bent to be arcuate in a transverse section having a rigid synthetic layer formed on said metallic sheet, comprising the steps of:

providing a metallic sheet of a specific length in a flat state,

bending said metallic sheet at a plurality of positions forming a plurality of small arcuate sectional protuberences extending in a longitudinal direction and distributed only a width direction, each of said small arcuate sectional protuberences having a separate center of curvature being curved to a first center of curvature;

bending in-between portions between said respective adjacent small arcuate sectional protuberences to form inbetween arcuate curved portions in said longitudinal direction and distributed in a width direction to be arcuate in a transverse section, each of said in-between arcuate curve portions having a separate center of curvature being curved to a second center of curvature;

bending said metallic sheet as formed with said plurality of small arcuate sectional protuberences and said in-between curved portions to be arcuate in transverse section with respect to a third center of curvature, said third center of curvature and each of said first centers of curvature being positioned on the same side with respect to said metallic sheet while said second center of curvature is located on a side opposite to that of said first and third centers of curvature with respect to said metallic sheet; and

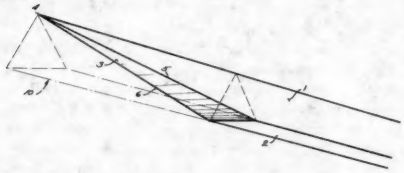
coating a rigid synthetic resin layer over both main surfaces of said bent metallic sheet, said composite member being formed in a length substantially the same as the length of said metallic sheet, said plurality of small arcuate sectional protuberences being formed as protuberences extending continuously throughout the length of said metallic sheet.

4,617,718

METHOD IN THE MANUFACTURE OF TARTAR REMOVING DENTAL INSTRUMENTS

Eilert Andersson, Vikmanshyttan, Sweden, assignor to Dentalvarutjanst AB, Orebro, Sweden

Filed Aug. 7, 1984, Ser. No. 638,368
Claims priority, application Sweden, Aug. 16, 1983, 8304420
Int. Cl.[4] B23P *13/04;* A61C *17/00*
U.S. Cl. 29—558 11 Claims



1. A method of manufacturing a tartar removing dental instrument, comprising the steps of:

(a) selecting a profiled blank having a substantially constant triangular cross-section formed by three lateral faces, each of which are unground and having a first end;

(b) grinding the blank solely along one of the lateral faces to effect the removal of material, the grinding being practiced to increase the removal of material toward the first end of said one lateral face being ground; and

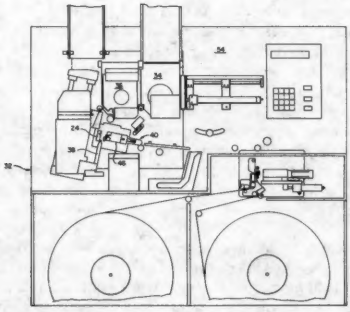
(c) continuing grinding to produce an instrument having a triangular cross-section tapering toward a tip formed at the first end, at least two of the three edges along the lateral faces of the instrument adjacent thereto being ground to form cutting edges.

4,617,719

TAPE STAKING AND CONTROL APPARATUS

George M. Woodley, Shrewsbury, Mass., assignor to King Instrument Corporation, Westboro, Mass.

Filed Oct. 15, 1985, Ser. No. 787,779
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—564.6 31 Claims



1. A mechanism for staking a leader block to the end of a tape that has been wound into a cartridge, said staking mechanism comprising:

leader block holding means for holding in a predetermined position a leader block that has a groove for receiving both the end of a tape and a staking rod for staking said tape end to said leader block;

a staking head comprising a staking block having a transversely-extending passageway for receiving a staking rod and a longitudinally-extending slot that intersects said passageway and terminates in a staking rod ejection opening at one end of said staking head, means closing off one end of said passageway, and rod moving means for shifting a staking rod in said passageway stepwise (a) first into said slot and (b) then out of said ejection opening into the said groove of a leader block;

means mounting said staking head for reciprocal movement along a selected axis toward and away from a leader block held by said leader block holding means; and

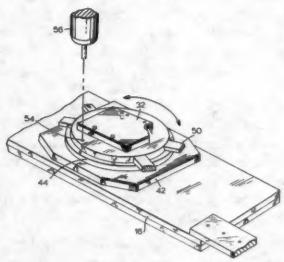
selectively operable means for sequentially (a) operating said rod moving means so as to cause said rod moving means to shift a staking rod from said passageway into said slot, (b) moving said staking head along said selected axis from a first position in which said one end of said staking head is spaced from a leader block held in said predetermined position to a second position in which said one end of said staking head is engaged with a leader block held in said predetermined position, (c) operating said rod moving means so as to cause said rod moving means to eject said staking rod from said slot through said staking rod ejection opening and forcing it into the said groove of a leader block held in said predetermined position, (d) operating said rod moving means so as to retract it away from said rod ejection opening while holding said staking head engaged with a leader block, and (e) subsequently moving said staking head along said axis from said second position back to said first position.

4,617,720

AUTOMATED MACHINE TOOL HAVING A ROTARY INDEXING FIXTURE

Kenneth J. Palfery, Toronto; Donald R. Puckering, Georgetown; Angel Kocev, Toronto, and Kenrick B. Maharaj, Brampton, all of Canada, assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Dec. 14, 1984, Ser. No. 681,793
Int. Cl.[4] B23Q *3/157*
U.S. Cl. 29—568 2 Claims



1. An automated machine tool having a rotary indexing table, comprising:

(a) a frame;

(b) a movable worktable means connected to the frame for supporting a workpiece and movable longitudinally an latitudinally to position a workpiece at a desired point in a horizontal plane;

(c) a rotatable spindle means for supporting and rotating a cutting tool at a predetermined speed rate, and mounted on a drive head connected to a vertical quill of the frame for vertical movement thereon to machine the workpiece;

(d) a tool changing means connected to the frame for storing tools and exchanging the tool supported in the rotatable spindle means with one of a multitude of different tools stored therein;

(e) an indexing tool configured to be supported by the rotatable spindle means;

(f) a rotatable indexing table for supporting the workpiece mounted on the movable worktable means having an aperture therein for receiving the indexing tool supported in the rotatable spindle means and causing rotation of the

workpiece 360° degrees in response to the longitudinal and latitudinal movements of the movable worktable means; and

(g) a programmable control means disposed to control the movable worktable means, the rotatable spindle means, the tool changing means, and the rotary indexing table for automatically rotating the workpiece on the rotary indexing table for machining.

4,617,721

JAW CHANGING APPARATUS

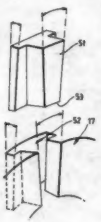
Joseph F. Jackson, Halifax, England, assignor to Pratt Burnerd International Limited, Halifax, England

Filed Oct. 12, 1984, Ser. No. 660,235

Claims priority, application United Kingdom, Oct. 12, 1983, 8327294

Int. Cl.⁴ B23Q *3/155*

U.S. Cl. 29—568 **22 Claims**



1. A changeable chuck jaw assembly for changing a jaw of a generally cylindrical chuck of a machine tool, said chuck having a chuck body, comprising the chuck body, a tapered jaw-way in the chuck body having a jaw mouth opening to the front of the chuck body and a recess behind and wider than the mouth, said jaw-way also having an entry mouth, with the jaw-way widest at the entry mouth, and a tapered jaw means for cooperating with the tapered jaw-way to enter the jaw-way even if not aligned with a preselected working position of the jaw means and to be guided to the preselected working position after entry into the entry mouth, said jaw-way and said jaw means each having a width and a depth which increase in the radially outward direction, said jaw means mounted for sliding radial working movement in the jaw-way.

4,617,722

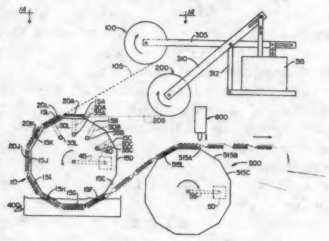
METHOD FOR ELECTRICALLY INTERCONNECTING SOLAR CELLS

John G. Willis, Chelmsford, Mass., assignor to Mobil Solar Energy Corporation, Waltham, Mass.

Filed Dec. 4, 1984, Ser. No. 677,877

Int. Cl.⁴ H01L *31/18, 25/02*

U.S. Cl. 29—572 **16 Claims**



1. A method for electrically interconnecting a plurality of photovoltaic solar cells in series, said solar cells each having a top surface characterized by a top grid electrode and a bottom surface characterized by a bottom electrode;

said method involving the use of a rotatable multi-faced drum, and first and second movable bus supply spools supporting first and second continuous electrically conductive bus strips, respectively;

said drum being adapted for (1) releasably holding a solar cell on each of its faces, and (2) rotation on its axis in an indexing mode so that it advances intermittently in a selected direction one face at a time, whereby at the conclusion of each indexing motion one face of said drum is always disposed in a predetermined loading position in which it extends in a first selected plane and an adjacent face of said drum is always disposed in a predetermined post-loading position in which it extends in a second selected plane disposed at an angle to said first selected plane, said first and second bus supply spools each being adapted to be moved between a first position wherein the associated bus strip extends substantially flush with the drum face which currently occupies said drum's post-loading position, and a second position wherein the associated bus strip extends substantially flush with the drum face which currently occupies said drum's loading position;

said method comprising the steps of:

(1) positioning said first bus supply spool in its said first position with said first bus strip extending around said drum and substantially flush with the drum face occupying said post-loading position, and positioning said second bus spool in its said second position with said second bus strip extending around said drum and substantially flush with the drum face occupying said loading position;

(2) positioning a first solar cell on the drum face occupying said loading position so that said first solar cell extends over and engages said second bus strip, with the bottom electrode of said first solar cell overlying and contacting said second bus strip;

(3) indexing said drum forward one face so that said drum face carrying said first solar cell is advanced to said post-loading position, whereby said first bus strip is caused to extend across and overlie the top grid electrode of said first solar cell while said second bus strip remains in contact with the bottom electrode of said first solar cell;

(4) shifting said first bus spool from its first position to its second position and shifting said second bus spool from its second position to its first position, so that said second bus strip extends flush with the drum face which is in said post-loading position and said first bus strip extends flush with the drum face which is in said loading position;

(5) positioning a second solar cell on the drum face which is in said loading position so that the bottom electrode of said second solar cell overlies and engages said first bus strip;

(6) indexing said drum forward one face so that the drum face carrying said second solar cell is advanced to said post-loading position, whereby said second bus strip is caused to overlie and engage the top grid electrode of said second solar cell even as said first bus strip remains in contact with the bottom electrode of said second solar cell;

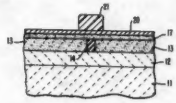
(7) shifting said first bus spool from its second position back to its first position, and shifting said second bus spool from its first position back to its second position, so that said first bus strip extends flush to the drum face which currently occupies said post-loading position, and said second bus strip extends flush to the drum face which currently occupies said loading position; and

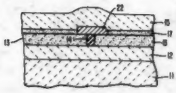
(8) thereafter securely attaching said first and second bus strips to the adjacent engaged electrodes of said first and second solar cells.

4,617,723
METHOD AND DEVICE FOR CREATING AN ACTIVATABLE CONDUCTING LINK IN A SEMICONDUCTOR DEVICE

Ryoichi Mukai, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 28, 1983, Ser. No. 566,411
Claims priority, application Japan, Dec. 28, 1982, 57-230100
Int. Cl.[4] H01L *21/263, 21/26*
U.S. Cl. 29—576 B **22 Claims**





1. A method of creating and activating a conducting link selectively activatable in combination with a plurality of conducting paths in a specified portion of a semiconductor circuit between the conducting paths formed in the same level and electrically insulated from each other, said method comprising the steps of:

(a) forming a first insulating layer of silicon covering the specified portion between the conducting paths to be linked;

(b) forming a metal film on the insulating layer over the specificed portion in contact with the insulating layer and creating an activatable conducting link between the conducting paths;

(c) forming a second insulating layer over the first insulating layer and the metal film; and

(d) activating the activatable conducting link, when activation is required, by heating the metal film and the corresponding portion of said insulating layer in contact with the metal film, by irradiation through the second insulating layer using an energy beam, to convert the metal film and the portion of the insulating layer in contact with the metal film into a metal silicide layer making the activatable conducting link conductive.

4,617,724
PROCESS FOR FABRICATING HETEROJUNCTION BIPOLAR TRANSISTOR WITH LOW BASE RESISTANCE

Naoki Yokoyama, and Toshio Ohshima, both of Atsugi, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 620,091, Jun. 13, 1984, abandoned. This application Sep. 30, 1985, Ser. No. 781,787
Claims priority, application Japan, Jun. 30, 1983, 58-119097; Nov. 19, 1984, 59-242414
Int. Cl.[4] H01L *21/265*
U.S. Cl. 29—576 B **74 Claims**

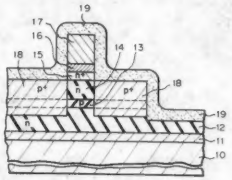
1. A process for fabricating a heterojunction bipolar transistor, comprising the steps of:

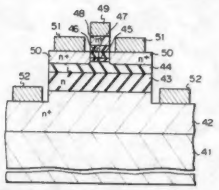
forming a collector layer on a substrate;

forming a base layer on the collector layer;

forming an emitter layer on the base layer, the emitter layer forming a heterojunction with the base layer and having a larger bandgap than that of the base layer;

forming an emitter electrode on part of the emitter layer;





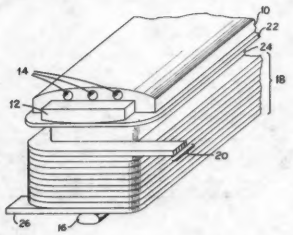
carrying out doping of dopants into part of the emitter layer and the base layer, using the emitter layer as a mask, so as to form a base contact region in alignment with an edge of the emitter electrode and reaching the base layer; and

forming a base electrode on said base contact region.

4,617,725
METHOD OF MAKING MULTIPLE-ELEMENT STRAP WINDING FOR ROTOR POLE

Warren G. Holter, Bradenton, Fla., and Lawrence V. Van Laanen, West Allis, Wis., assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Oct. 1, 1984, Ser. No. 656,351
Int. Cl.[4] H02K *15/095*
U.S. Cl. 29—598 **2 Claims**



1. The method of producing a winding for large AC salient pole dynamoelectric machines, comprising the steps of

providing a pole formed of a magnetic material;

surrounding the body of said pole with flexible pole insulation material;

disposing a collar formed of substantially rigid insulating material over said pole and an adjacent head portion;

providing a plurality of insulated conductors arranged side by side to form an array having a lateral dimension equal to the sum of the diameters of all of the conductors in the array, each of said conductors having a width to height ratio of at least 4:3 and being provided with a resilient varnish insulation thereon said width being measured in the same direction as said lateral dimension;

securing one end of said conductor array adjacent said pole body;

applying a curable resinous material to said array;

rotating said pole about an axis generally perpendicular to the lateral dimension of said array to cause said array to be wrapped around said pole body edgewise to form a single layer of edgewise wound array turns about said body;

curing said resinous material; and

brazing together the ends of the conductors in said array to form a single-layer winding about said pole body.

4,617,726

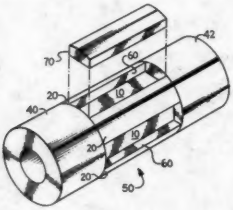
MAXIMUM STIFFNESS PERMANENT MAGNET ROTOR AND CONSTRUCTION METHOD

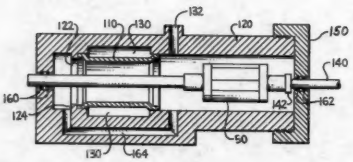
Joseph Denk, Manhattan Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 6, 1984, Ser. No. 678,740

Int. Cl.⁴ H02K *15/02*

U.S. Cl. 29—598 **27 Claims**





20. A permanent magnet rotor, comprising:

an inner cylinder of magnetizable material;

a hollow outer cylinder of non-magnetizable material surrounding and bonded to said inner cylinder, thereby forming an assembly;

a plurality of permanent magnets mounted in pockets machined into and through said outer cylinder, said magnets being in contact with said inner cylinder;

a first end piece of non-magnetizable material bonded to one end of said assembly;

a second end piece of non-magnetizable material bonded to the other end of said assembly; and

a sleeve of non-magnetizable material installed over said magnets and the portions of said outer cylinder therebetween.

4,617,727

ELECTRODE COMB AND METHOD AND DEVICE FOR MANUFACTURING

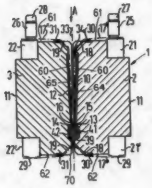
Martin Pointner, Kirchseon, and Rüdiger Sommer, Raisdorf, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Division of Ser. No. 488,380, Apr. 25, 1983, Pat. No. 4,540,151. This application May 3, 1985, Ser. No. 729,967

Claims priority, application Fed. Rep. of Germany, May 7, 1982, 3217290

Int. Cl.⁴ H01R *43/00*

U.S. Cl. 29—825 **3 Claims**



1. A method of forming an electrode comb having two rows of needle-shaped recording electrodes connected to two circuit boards and embedded in a one-piece molded body of resin having a rib with a recording edge along one edge of the body with the recording electrodes extending to a surface of said recording edge, said method comprising the steps of providing a mold comprising two symmetrically constructed halves with a rectangular cross-section, each half having a first face with a flat planar surface, a second face opposite the first face having a first recess for receiving a circuit board with conductor paths, a second recess separated from the first recess by a support surface, third and fourth faces extending between the first and second faces, each of the said third and fourth faces having a recess adjacent the first face, and said third face having means for clamping the wires to said surface; assembling the halves with the first surfaces engaging each other to form a parting plane of a winding core with the second face facing in an opposite direction; assembling a circuit board in each of said first recesses; winding a wire around the core with equal spacing and pitch between turns; clamping the wound wire to each of the halves; electrically connecting each of the turns to its respective circuit board; severing the wire turns in two places adjacent the parting plane; disassembling the two halves and rotating at least one of the two halves 180° to the other half to reassemble the halves with the second faces adjacent each other to form a casting mold with a first mold cavity formed by the first recesses containing the circuit boards and a second mold cavity being formed by the second recesses with the rows of wires extending therethrough and offset from each other; injecting a resin into each of said mold cavities; and subsequent to the hardening of said resin, trimming the exposed wires extending from each cavity to form the electrode comb having a rib with the recording edge formed by the resin in the second cavity.

4,617,728

METHOD AND DEVICE FOR MOUNTING ELECTRONIC COMPONENTS ON A PRINTED CIRCUIT CARD

Axel Andersen, Solvcenget, and Klaus Bondergaard, Gentofte, both of Denmark, assignors to Sincotron APS, Denmark

Filed Jun. 11, 1984, Ser. No. 619,201

Claims priority, application Sweden, Jun. 13, 1983, 8303330

Int. Cl.⁴ H05K *3/30;* **B23P** *19/00*

U.S. Cl. 29—836 **8 Claims**

1. A method for mounting electronic components without connector pins and having a dimension in one axial direction larger than in a second axial direction onto a substrate having adhesive thereon at mounting sites for said components, said method comprising the steps of:

providing storage tray means for storing said components prior to mounting said components onto said substrate, a surface of said storage tray means having grooves therein adapted to receive said components in a predetermined orientation, said grooves being narrower in width than the larger axial dimension of said components;

sliding said components across the surface of said storage tray means in a direction transverse to said grooves, whereby said components are received in and oriented in said grooves;

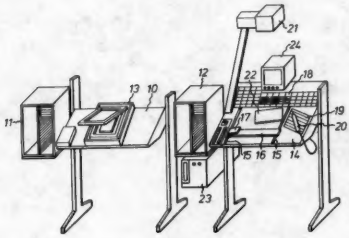
providing a suction means having sufficient suction force to lift said components;

removing said oriented components from said storage tray means by said suction means and transferring said components to said adhesive on said substrate; and

said suction force produced by said suction means being less than are attractive force of said adhesive on said substrate.

2. An apparatus for mounting electronic components without connector pins and having a first dimension in one axial direction larger than a second dimension in a second axial direction onto a substrate having adhesive thereon at predetermined mounting sites for said components, said apparatus comprising:

table means for supporting said substrate thereon;



tray means adjacent the table means for holding said components, said tray means being pivotable relative to the table means about an axis of rotation and having a surface with grooves therein parallel to said axis of rotation, said grooves being narrower in width than said first dimension and larger than said second dimension and being adapted to receive said components in alignment with the grooves;

suction means operatively associated with said table means for lifting said components from said tray means and transferring the components to the substrate, the suction means being movable between the tray means and the table means;

indicator means operatively associated with the table means and the tray means, the indicator means being operable to indicate a corresponding pair of said grooves and said mounting sites, whereby components are identified to be lifted from said tray means to specific identified mounting sites on said substrate; and,

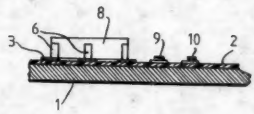
driving means operatively associated with said tray means for pivoting said tray means about said axis of rotation, whereby pivoting said tray means about said axis of rotation causes said components on said tray means to slide across said tray means in a direction transverse to said grooves, the components being received in the grooves.

4,617,729

PROCESS FOR MANUFACTURING MINIATURIZED ELECTRONIC POWER CIRCUITS

Jean Celnik, Paris, France, assignor to Automobiles Citroen, Neuilly Sur Seine and Automobiles Peugeot, Paris, both of, France

Filed Feb. 27, 1985, Ser. No. 705,987
Claims priority, application France, Feb. 28, 1984, 84 03485
Int. Cl.[4] H05K *3/34*
U.S. Cl. 29—840 **7 Claims**



1. A process for manufacturing a miniaturized electronic power circuit including power elements and other components soldered to a conducting network with the interposition of an insulator between said network and a heat conducting plate forming a heat sink, comprising the steps of:

(a) coating a plastic film on one side with a highly conductive metal layer to form a laminate foil therewith;

(b) bonding said laminate foil to said plate on an opposite uncoated side of said plastic film to form a substrate consisting of said foil and said plate;

(c) forming said conducting network from said metal layer;

(d) depositing soldering paste at selected locations of said network;

(e) placing said components flatly on the foil of said substrate with terminals thereof in registration with certain of said locations;

(f) placing said power elements flatly on the foil of said substrate with bodies of said power elements in registration with other of said locations and terminals of said power elements in registration with said certain of said locations;

(g) hard soldering said components and said power elements at said locations in a vapor phase to said network; and

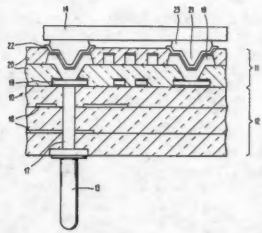
(h) placing the resulting circuit in a sealed case.

4,617,730

METHOD OF FABRICATING A CHIP INTERPOSER

Pieter Geldermans, and Gangadhara S. Mathad, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 13, 1984, Ser. No. 639,988
Int. Cl.[4] H01R *4/00*
U.S. Cl. 29—843 **29 Claims**



1. A method of fabricating an interposer for connecting a plurality of semiconductor chips to a substrate, comprising, in sequence, the steps of:

providing an insulating support having a thin film fine line metallization formed on its top surface before the top

surface is interrupted by holes interfering with fine line photolithography,

depositing a layer of masking material adhering well to the support onto the bottom side of said support,

removing said masking material according to a desired pattern, so as to expose areas of the support where via holes are to be formed,

etching the exposed areas of the support until reaching said metallization, whereby via holes are created through the suppport,

depositing an interconnecting metallurgy on the backside of the support including the interior of said via holes, whereby an electrical connection is made between said thin film fine line metallization on the top side and the bottom side of said support, and

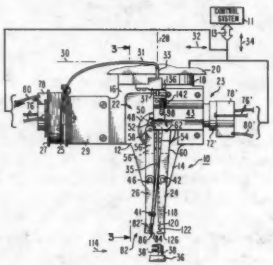
forming a contact pad around each via hole.

4,617,731

INSULATION DISPLACEMENT TERMINAL WIRE INSERTION TOOL AND METHOD

Ross M. Carrell, Cinnaminson, N.J., and George J. Whitley, Philadelphia, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 23, 1985, Ser. No. 779,100
Int. Cl.[4] H01R *43/04*; B23P *19/02*
U.S. Cl. 29—861 **20 Claims**



1. A wire insertion tool for inserting a wire into electrical engagement with an insulation displacement terminal (IDT) on a substrate, said terminal including a set of spaced tines extending in a given direction for receiving at one end thereof said inserted wire and further including tine support structure at the other end thereof for securing said tines to a post extending approximately normal to said direction, said tool comprising:

a support adapted to be attached to an automatic insertion tool head which locates and moves the tool relative to said IDT;

a first element movably secured to the support having an open state and a terminal support state, said element having a groove therein adapted for receiving and mating with said tine support structure in said support state, said groove and support structure being dimensioned such that said receiving tends to align said tines relative to said groove;

a second element movably secured to the support having an open state, a closed state and a wire insertion state between its open and closed states, said second element including a wire insertion member adapted to mate with said tines in said insertion state for pushing said wire into said electrical engagement with said aligned tines;

wire feed means secured to the support for feeding said wire between and aligned with said groove and said insertion member; and

actuating means coupled to the support and the first and second elements for initially causing said first element to move from its open state to its support state to seat and align said tine support structure in said groove and thereby align said tines relative to said second element, and then for causing said second element to enter said insertion state to push said wire toward the first element and into said engagement with said tines while said first element supports said tines at said tine support structure with negligible reaction forces on said tool head and on said substrate.

17. A method for attaching a wire to an insulation displacement terminal (IDT) having a set of tines open at one end to receive a wire to be attached thereto, a support structure at the other end of said set, and a post for attaching said tines substantially parallel to a substrate so the inserted wire is normal to the substrate, said method comprising:

(a) supporting said terminal at said support structure;

(b) pushing a first portion of said wire into engagement with said tines in a direction toward said supported support structure and parallel to the substrate;

(c) releasing the support structure and pushed portion;

(d) aligning a second wire portion of said wire with a second terminal;

(e) repeating the steps a–c; and then:

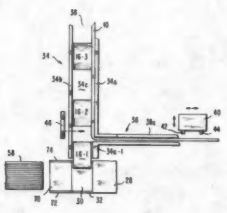
(f) severing the wire from the last-attached terminal.

4,617,732

METHOD FOR TERMINATION OF FLAT CABLE

William R. Beck, Warren, N.J.; William Jahn, Iowa City, Iowa; Steven R. Koltenback, Doylestown, Pa.; Robert M. Scharf, Bedminster, and Ronald Schwab, Budd Lake, both of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Dec. 31, 1984, Ser. No. 687,622
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—866 **23 Claims**



1. A method for mass termination of elongate flat multiconductor cable by use of elongate connectors having a body supporting insulation-displacing contacts arranged in at least one longitudinal row therein and a cover movably supported over said body, comprising the

(a) releasably assembling individual such connectors to a substrate;

(b) defining a cable mass termination station;

(c) advancing said substrate along a preselected path to dispose an individual such connector at said cable mass termination station;

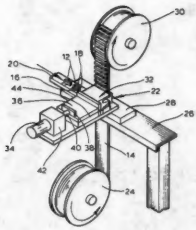
(d) advancing said cable along the cable longitudinal axis to said cable mass termination station and into overlying registry with said insulation-displacing contacts of said individual connector between said cover and said body; and

(e) moving said cable relative to said insulation-displacing contacts and effecting electrical engagement of said cable conductors individually with said insulation-displacing contacts.

4,617,733
PROCESS OF MANUFACTURING A FLEXIBLE SUBSTRATE ASSEMBLY

Thor Olson, Wheaton, Ill., assignor to Molex Incorporated, Lisle, Ill.

Division of Ser. No. 597,637, Apr. 6, 1984. This application Dec. 27, 1985, Ser. No. 791,471
Int. Cl.⁴ H01R *43/16*
U.S. Cl. 29—874 **38 Claims**



1. A method of manufacturing a flexible substrate assembly, said assembly including a plurality of solid members, each solid member having a plurality of spaced apart rigid pin-like projections extending therefrom, mounted on a flexible support substrate, said method comprising the steps of:

(a) disposing a portion of said substrate in a generally flat configuration at a work station;

(b) disposing one of said solid members in juxtaposition to said flat substrate portion at said work station such that the projections of said solid member exend toward said substrate;

(c) moving said solid member with respect to said flat substrate portion at the work station so that said projections penetrate the substrate to removably mount said solid member therein;

(d) moving said substrate so that said mounted solid member is moved away from said work station and another flat substrate portion is provided thereat;

(e) disposing another solid member at said work station as set forth in step (b) above;

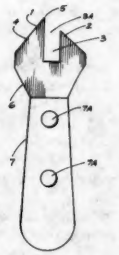
(f) moving said another solid member with respect to said another flat substrate portion as set forth in step (c) above;

(g) repeating steps (d), (e) and (f) until a desired number of solid members have been mounted on said substrate.

4,617,734
OYSTER OPENER

Brian Parkinson, 10 Euroka Street, West Wollongong, New South Wales, Australia (2500)

Filed Jun. 11, 1984, Ser. No. 618,980
Int. Cl.⁴ A47J *13/00, 43/26*
U.S. Cl. 30—120.1 **2 Claims**



1. A utensil for opening oyster or clam shells or the like comprising a jaw defined by first and second blade-like projections.

said first projection being of greater length than said second projection for insertion between the closed edges of said shells, and further adapted to subsequently grip one of the opened shells and enable its removal by a twisting or leveraged action of the utensil; the outer edge of said first projection being angled to provide a wedge-shaped profile slanted downwardly to terminate in a point a short distance below the level of said second projection; said outer edge further containing an upstanding flange disposed at right angles thereto and sloping toward said point;

said second projection being adapted to engage the outer surface of said shells to thereby prevent the excessive penetration of said first projection and avoid mutilation of the meat within said shells;

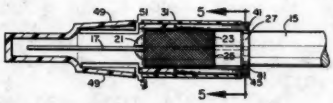
the sides of said jaw converging slightly toward the open end thereof; said jaw being secured to a handle contoured to fit a user's hand with the user's thumb abutting the outer face of said flange and the user's forefinger resting against the upper surface of said second projection; the outer edges of said first and second projections leading back towards said handle being angled inwardly to provide a means of guarding against the user's hand inadvertently slipping onto the surfaces of said projections; and

wherein said point and the internal perimeter of said jaw are slightly rounded to provide a more finished appearance to said first and second projections and to avoid any unnecessary sharp edges.

4,617,735
SAFETY CAP

Sidney Silverstein, Flushing, N.Y., assignor to Hunt X-ACTO, Inc., Philadelphia, Pa.

Filed Oct. 21, 1985, Ser. No. 789,711
Int. Cl.⁴ B26B *29/02*
U.S. Cl. 30—151 **8 Claims**



1. A safety cap assembly for a craft knife having a blade and a handle comprising

a cap housing having a front end portion and a rear end portion with an opening at the end of the front end portion for receiving the knife blade,

attaching means on the front end portion of the housing for attaching it to the knife handle,

sleeve means mounted on the housing adapted for sliding back and forth between the front end and the rear end portions of the housing for closing the attaching means in attaching position when the sleeve means is at the front end portion of the housing and for opening the attaching means when the sleeve means is at the rear end portion,

stop means at the ends of the housing for preventing the sleeve means from slipping off the housing,

and safety-locking means on the housing for releasably locking the sleeve means in position on the front end portion when the sleeve means is closing the attaching means whereby to prevent the cap assembly from opening and being pulled off the knife accidentally.

4,617,736

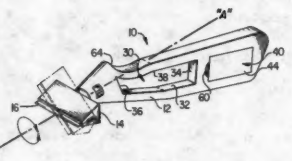
SWIVEL HEADED SCRAPING DEVICE

Mark W. McCrary, Rte. 3, Box 25, Waxahachie, Tex. 75165

Filed Aug. 2, 1984, Ser. No. 637,038

Int. Cl.[4] B26B *3/00*

U.S. Cl. 30—169 1 Claim



1. A handheld scraping device comprising a handle, barrel neck, head, razor blade and razor housing;

said handle being large enough to be held in a human hand, having a cutout portion, and containing said razor housing sized to receive at least one razor blade;

said barrel head being attached to said head having a collar to abut said handle, a first flange finger and a second flange finger to nonremovably engage with said handle said barrel neck allowing said head to freely rotate about an A—A passing through said handle's elongate axis B—B at an angle less than about 30°, but greater than about 5°;

said head having a gap and chamber means to frictionally engage said razor blade so that said blade lies in a plane containing said axis of rotation A—A, and allowing the cutting edge of said razor blade to project beyond the outer edge of the head;

said handle, head, and barrel neck made of polypropylene; and

said razor housing having room for five razor blades, having a cover which is removably engaged with said housing, and having a notch to allow the user to remove said cover with his finger tip.

4,617,737

MACHINE FOR CUTTING OUT FLAT MATERIAL

Rolf Jung, Waiblingen, Fed. Rep. of Germany, assignor to Krauss u. Reichert GmbH & Co. KG, Fellbach, Fed. Rep. of Germany

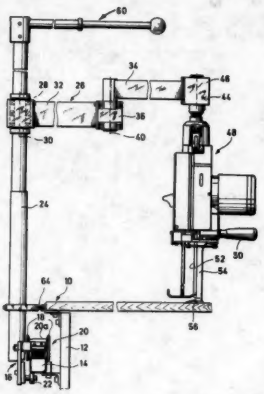
Filed Mar. 29, 1985, Ser. No. 717,627

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414123

Int. Cl.[4] B26D *1/06;* D06H *7/24*

U.S. Cl. 30—273 7 Claims

1. A machine for cutting flat material, comprising a support having an upper surface for supporting such flat material to be cut; guide means mounted on said support and extending along one side thereof; a carriage supported by said guide means for movement along said one side of said support; a tiltable upright mounted on said carriage; a beam supported by said tiltable upright extending over the upper surface of said support; said beam having at least an inner and an outer beam section; said inner beam section being pivotally mounted at one end along a first pivot axis to said tiltable upright; a first bearing for pivotally mounting said inner beam section on said tiltable upright; a second bearing for pivotally connecting ends of the outer beam section and the inner beam section along a second pivot axis; cutting means pivotally mounted on a distal end portion of said outer beam section; a third bearing for pivotally mounting said cutting means on the distal end portion of said outer beam section along a third pivot axis; said cutting means having a foot for resting on the upper surface of said support; said first, second and third pivot axes being substantially vertically disposed to said support upper surface when said foot contacts said upper surface; said carriage having mounting means for mounting said carriage on said guide means and for cooperative engagement with the guide means in such manner that said



upright is tiltable about a tilt axis parallel to said support upper surface.

4,617,738

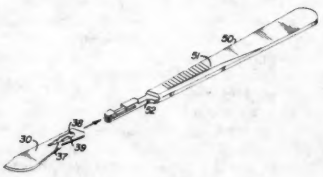
SURGICAL BLADE HANDLE

Bernard F. Kopacz, Little Falls, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Apr. 25, 1984, Ser. No. 603,856

Int. Cl.[4] A61B *17/36*

U.S. Cl. 30—339 13 Claims



1. A handle and surgical blade assembly wherein the surgical blade is removably engaged with the handle comprising: a substantially planar surgical blade having a slot with a relatively wide proximal portion and a relatively narrow distal portion and a transition portion therebetween;

a handle including a rearward end to be held by the user and a forward end;

an elongate tang at said forward end having a proximal end, a distal end and an elongate boss projecting outwardly from a side of said tang adjacent to said distal end, said boss being narrower in width than the width of said wide proximal portion of said surgical blade slot;

said tang including a pair of opposed longitudinal grooves originating at said distal end and terminating in said proximal end, said grooves running substantially along the interface of said tang and said boss, said grooves being wider than the thickness of said surgical blade in an area adjacent to said surgical blade slot, said grooves adapted to receive the narrow distal portion of said surgical blade slot;

said tang including a relief recess projecting into said boss to a depth at least as deep as that portion of said boss extending outwardly from said grooves away from said tang, said recess thereby dividing said boss into a forward boss portion and a rearward boss portion, said recess being

positioned so that the distance between the distal end of said forward boss portion and the distal end of said rearward boss portion is less than the length of said narrow distal portion of said surgical blade slot; and

said surgical blade being engaged with said handle so that said narrow distal portion of said slot is engaged by said forward boss portion and said rearward boss portion and also is engaged in said longitudinal grooves and said boss is protruding through said slot.

4,617,739

LEAD DEVICE FOR DRAWING MACHINE

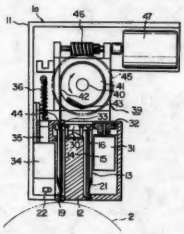
Akio Kubo, 655 Yamanouchi, Kamakura shi Kanagawaken, Japan

Filed Jan. 10, 1985, Ser. No. 690,793

Claims priority, application Japan, Jan. 12, 1984, 59-3220[U]; Jan. 12, 1984, 59-3221[U]; Jan. 12, 1984, 59-3222[U]; Jan. 12, 1984, 59-3223[U]; Jan. 27, 1984, 59-13795

Int. Cl.[4] G01D *15/24*

U.S. Cl. 33—18.1 **13 Claims**



1. A lead feed device for a drawing machine in which a turret drum is rotatably and slidably mounted on a shaft mounted on a bottom plate and lead bars are inserted in longitudinal recesses in said turret drum, a lead bar pressing device provided above said turret drum, said lead bar pressing device comprising a rotatable disc on which a wire for pressing said lead bar is wound, one end of said wire abutting against one end of said lead bar in said turret drum.

4,617,740

MEASURING DEVICE FOR A FIGURE

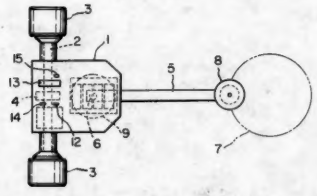
Kobayashi Mikio, 3-14-20 Sakura, Setagaya, Tokyo, Japan

Filed Jun. 24, 1985, Ser. No. 748,308

Claims priority, application Japan, Jun. 22, 1984, 59-129550; Jul. 30, 1984, 59-160962; Jan. 29, 1985, 60-11452[U]

Int. Cl.[4] G01B *5/26, 7/32*

U.S. Cl. 33—122 **10 Claims**



1. A measuring device for a figure comprising; a carriage supported by a pair of wide width wheels so as to reciprocally move along a straight line; a carriage pulse generator for producing a series of pulses whose number is proportional to the rotation angle of said wheels; a measuring lever rotatable supported on said carriage about a vertical shaft; tracing means on the end of said measuring lever; a measuring lever pulse generator for producing a series of pulses whose number is proportional to the rotation angle of the said measuring lever; a sine angle signal generator and cosine angle signal generator for generating signals from signals received from said measuring lever pulse generator; and calculating means for calculating coordinate, length and area from said sine and cosine signals and signals from said measuring lever pulse generator.

4,617,741

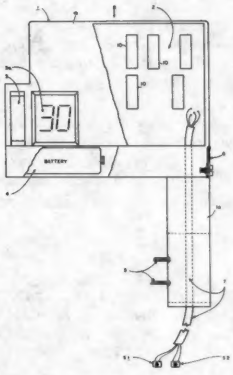
ELECTRONIC RANGEFINDER FOR ARCHERY

Marvin L. Bordeaux, and Dennis R. Ward, both of Rte. 3 Box 2, Willcox, Ariz. 85643

Filed Dec. 17, 1984, Ser. No. 682,544

Int. Cl.[4] F41G *1/00*

U.S. Cl. 33—228 **11 Claims**



1. A rangefinding apparatus for attachment to a bow, comprising in combination:

(a) a transparent viewing window through which a target having a first preselected size can be viewed by an archer aiming the bow in a drawn configuration at the target;

(b) first display means for selectively displaying an upper target bracketing line and a lower target bracketing line in the transparent viewing window, the lower bracketing line being below and spaced from the upper target bracketing line, the location of the lower target bracketing line being selected for the first preselected size target;

(c) second display means for displaying a digital number corresponding to a distance between the upper target bracketing line and the first lower target bracketing line, and hence to the distance from the rangefinding apparatus to the target;

(d) upper bracketing line control means for effectively moving the upper target bracketing line in response to a control switch actuated by a finger of the archer's hand gripping a handle of the bow to cause the upper target bracketing line to visually bracket an upper portion of the target as seen through the transparent viewing window by the eye of the archer when the bow is aimed so that the lower target bracketing line appears to bracket a lower portion of the target; and

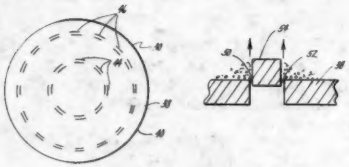
(e) digital display control means responsive to the control switch for causing the second display means to automatically display a digital number corresponding to the position of the displayed upper target bracketing line and hence to the distance from the rangefinding apparatus to the target.

4,617,742

HEAT TREAT APPARATUS

Roger L. Brummel, South Lyon, Mich., assignor to Fluidtherm Corporation, South Lyon, Mich.

Continuation-in-part of Ser. No. 574,891, Jan. 30, 1984, abandoned. This application Mar. 20, 1985, Ser. No. 713,864
Int. Cl.[4] F26B *17/10*
U.S. Cl. 34—57 A 6 Claims



2. A removable diffuser for heat treating apparatus, comprising:

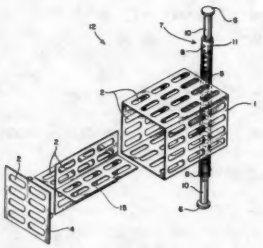
a tank defining a gas chamber, and having an inlet for receiving a gas, and a planar top diffuser wall forming a base for a bed of finely divided particles, the top diffuser wall having a pattern of slits for the passage of the gas, each slit being disposed adjacent a bulge in the wall formed perpendicular to the plane of the wall, and defining an opening sufficiently large to pass the gas from the gas chamber into the bed of particles in a direction generally perpendicular to the diffuser wall, but small enough to prevent the particles from passing through the slits into the gas chamber.

4,617,743

DRYER INSERT, HOLDER, CONTAINER

Richard Barnard, 2330 Olive Ave., Fremont, Calif. 94538

Filed Jan. 28, 1985, Ser. No. 695,843
Int. Cl.[4] F26B *11/04*
U.S. Cl. 34—109 1 Claim



1. An article holding container for insertion into a rotary drum dryer comprising:

a. compartment means to hold articles of clothing or any other article desired;

b. divider insert means to separate said compartment means into multiple chambers;

c. perforations in said compartment means and said divider means;

d. door, snap on type, for closing said compartment means;

e. expandable rod means to secure said article holding container to interior of said dryer;

f. spring means that will allow said expandable rod means to expand or contract;

g. skid resistant means at end of said expandable rod means that will secure said expandable rod means to interior of said dryer;

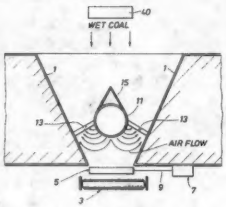
h. expandable rod lock means which will lock said expandable rod means in the expanded or contracted position.

4,617,744

ELONGATED SLOT DRYER FOR WET PARTICULATE MATERIAL

Mark A. Siddoway, Houston; James A. Salter, Katy, and Robert P. Deschner, Sugarland, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 24, 1985, Ser. No. 813,325
Int. Cl.[4] F26B *17/12, 11/12;* C10L *5/00;* C21D *9/70*
U.S. Cl. 34—168 33 Claims



1. A slot dryer for drying solid particulate material having two side members and therebetween a wet solid particulate material inlet at the top and a relatively dry solid particulate material outlet at the bottom, wherein wet solid particulate materials enters said slot dryer and passes downward through said slot dryer to egress in a relatively dry state through said bottom outlet; wherein said bottom outlet is defined by (1) a pair of non-connecting walls, one wall situated at an acute angle with respect to a horizontal plane extending perpendicular from said outlet flow and one wall situated at an obtuse angle with respect to said horizontal plane and (2) a pair of connecting walls of shorter height than either of said pair of non-connecting walls, said intersection of connecting walls forming a Λ-shape situated between said non-connecting walls; a shaking means to cause turbulence in said wet solid particulate material and to aid in the passage of said wet solid particulate material from the inlet of said slot dryer to the outlet of said slot dryer; wherein said relatively-dry solid particulate material outlet has an aperture formed between the pair of non-connecting walls and two connecting walls in the Λ-shape; and one or more elongated hollow conduits located transverse to the vertical axis of said slot dryer and relatively parallel to said bottom outlet, said conduit having operative means therein for passage of a drying fluid therethrough, said elongated hollow conduit being in communication with a drying fluid access means and being supported by support means in communication with said slot dryer, wherein said apertures in said elongated hollow conduit are situated only in not more than the lower one half of said elongated hollow conduit closest to the direction of said relatively dry solid particulate outlet at the bottom of said slot dryer to provide passage of said drying fluid in a direction down and outward with respect to the flow path of particulate material to insure first cocurrent and second countercurrent contact of said descending wet particulate material with said drying fluid.

4,617,745

AIR SHOE

Vijay K. Batra, 4 Daybreak, Turkey Hill Village, Wayland, Mass. 01778

Continuation-in-part of Ser. No. 523,265, Aug. 15, 1983, abandoned. This application Mar. 8, 1985, Ser. No. 709,863
Int. Cl.[4] A43B *7/06*
U.S. Cl. 36—3 B 6 Claims

1. In an air shoe having a shoe upper and a sole body joined to the upper,

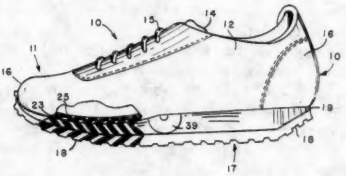
a bottom surface on said sole body having a predetermined tread design on said surface,

an upper surface on said sole body,

a ventilation channel network on the upper surface of said sole body consisting of

a plurality of longitudinal channels in said sole body contiguous with and opening at said upper surface extending from a position within the heel portion of said sole body to a position within the ball portion of said sole body and extending a substantial distance into the ball portion of said sole body,

a multiplicity of lateral channels in said sole body contiguous with and opening at said upper surface and crossing said longitudinal channels to divide said upper surface into a multiplicity of individual sections, each section at least partially surrounded by channels, at least one of said lateral channels being in said heel portion, a plurality of said channels being in the ball portion and at least one of



said channels being in the instep portion of said sole body, to form an intercommunicating network of channels as an air passage to the various longitudinal and lateral channels across substantially the full area of said sole, including both said heel portion and substantially the full area of said ball portion and to provide massagic action to a wearer's foot as the foot presses on and releases pressure from said sole body,

the channel at said instep portion leading from said intercommunicating channel network and terminating in an enlarged mouth at said instep location,

said network of channels being protected against lateral exits and entrances for air flow between said instep portion and a location fully within said ball portion of said sole body, whereby air from said instep portion of said sole body is conveyed into said ball portion as said wearer of said shoe exercises.

said mouth having a bottom surface declining downwardly from said channel to an open end at the edge of said sole.

4,617,746

KICKING SHOE

Mark Hannah, 206 Cedar Ave., Hinton, W. Va. 25951

Filed Aug. 12, 1985, Ser. No. 764,402

Int. Cl.[4] A43B *5/00, 5/02*

U.S. Cl. 36—133 **22 Claims**

1. An improved kicking shoe for use in a game which permits a game player to kick a ball, comprising:

a pad means which is positioned on the front portion of said shoe for integrally coupling thereabove, said pad means upwardly protrudes to an integral apex substantially in line with a center-line longitudinally extending along said shoe, said pad means integrally having: (a) an inclined precipice at a first end portion having an upper edge downwardly sloping from said integral apex to the middle portion of said shoe, (b) a side planar portion angularly opposed to said first end portion, (c) a side surface extending downward to wrap around a kicking side of said shoe, said side surface has a lesser downward slope than said planar portion slope, and (d) a front planar portion having a maximum protruding height at said integral apex and gradually decreasing therefrom when extending downwardly towards the bottom of said shoe; and

a sheath housing means integrally joined on said front portion of said shoe for overlapping the top portion of said pad means.

4,617,747

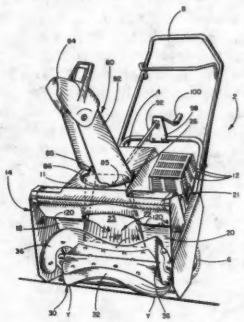
SINGLE STAGE SNOWTHROWER

Richard A. Thorud, Bloomington, and Donald M. White, III, Chanhassen, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Sep. 12, 1985, Ser. No. 775,288

Int. Cl.[4] E01H *5/09*

U.S. Cl. 37—244 **27 Claims**



1. An improved single stage snowthrower of the type having a housing that includes a generally open front portion defined by spaced side walls connected together by a rear wall; a rotatable snowthrowing impeller extending between the side walls and located in front of the rear wall; and engine means carried by the housing for rotating the impeller; and wherein the improvement comprises:

an impeller having at least one outwardly extending paddle for picking up and throwing snow, wherein the paddle comprises:

(a) a central snowthrowing section which extends over at least the middle one-half of the entire paddle's length, wherein the central section is curved forwardly from the midpoint to each side thereof to be generally concave such that snow is thrown in a stream that tapers inwardly as it rises from the central section;

(b) two end sections located on each side of the central section which fill out the remaining length of the paddle, wherein each end section comprises a relatively small portion of one turn of a helical auger having a relatively small pitch in relation to the paddle's length; and

(c) wherein the central snowthrowing section faces forwardly with respect to a radial line extending from the axis of rotation of the central section, wherein the amount

of the forward facing is from 5° and 20° at the midpoint of the central section and is approximately 0° at each side of the central section.

4,617,748

LABEL FOR EGG TRAYS AND THE LIKE

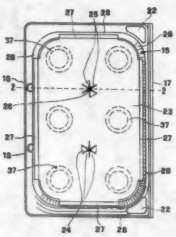
Pietro Padovani, Verona, Italy, assignor to I.S.A.P. Spa (Industrie Specializzate Articoli Plastici), Parona, Italy

Filed Feb. 28, 1985, Ser. No. 707,023

Claims priority, application Italy, Mar. 1, 1984, 84915 A/84

Int. Cl.⁴ G09F *3/00*

U.S. Cl. 40—312 **16 Claims**



1. In combination a container for eggs and the like and a label therefor, the container being made from sheets of synthetic thermoplastics material and comprising an upper portion having a top and sidewalls and a lower portion connected thereto by a rib along which the upper portion can be moved between an open and closed position and secured to the lower portion by means of pressure fastenings, in which the top of the upper portion is provided with inwardly projecting hollow projections with conical sections and recesses; the label being made of cardboard or the like and applied to the upper portion, the label comprising a central rectangular body with side edges and rounded corners, a substantially rectangular extension along at least one of the side edges of the central body which is folded to cover at least in part one of the side walls of the upper portion, and means produced by throughcuts corresponding to the projections enabling a plurality of open containers to be stacked.

4,617,749

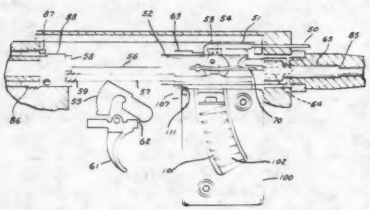
.22 CALIBER RIMFIRE ADAPTER SYSTEM FOR M16 TYPE RIFLE

Julius V. Jurek, 2046A Corsair Dr., Bethel Manor, Langley AFB, Va. 23665

Continuation of Ser. No. 720,468, Sep. 3, 1976, abandoned. This application Oct. 7, 1977, Ser. No. 840,470

Int. Cl.⁴ F41C *11/00*

U.S. Cl. 42—16 **15 Claims**



1. An adapter system for converting a rifle normally utilizing high power rifle cartridges of a given projectile caliber to a rifle utilizing low power cartridges of the same projectile caliber, the said rifle having a high power cartridge chamber; a gas tube; a receiver having a lower receiver extension socket, a magazine latch, and a bolt catch; the said adapter system comprising:

a. A low power cartridge bolt and chamber adapter assembly insertable in the said rifle receiver and high power cartridge chamber, the said bolt and chamber adapter assembly having a rear retainer, guide rails with the said bolt slidably positioned thereon, a cartridge rim receiving face on the said bolt, and the said chamber attached in flexible relationship to the said guide rails;

b. a forward locator pivotably attached in spring loaded relationship to the said rear retainer of the said adapter assembly cooperating with the said rifle lower extension socket to maintain the said chamber adapter seated in the said rifle high power cartridge chamber;

c. a gas diverter attached to the said adapter bolt cooperating with the said rifle gas tube for diverting powder gases and residue outside the said receiver;

d. means for providing a sealing relationship between the said projectile of the said low power cartridge and the said adapter chamber;

e. a cartridge case rim retainer having an undercut recess positioned on the said adapter bolt face;

f. an adapter magazine for feeding the said low power cartridges into the receiver, removably attachable to the said rifle receiver by the said magazine latch, the said magazine adapter having a follower spring and a lifter spring; and

g. means for coupling the said follower spring to the said lifter spring only when the said adapter magazine is empty of cartridges, the said means cooperating with the said rifle bolt catch to hold the said adapter bolt in the open position after firing the last cartridge from the said adapter magazine.

4,617,750

ANNULARLY SYMMETRICAL MULTIPLE FIRE WEAPON

Jacob W. Garehime, Jr., 1700 Griffith Ave., Las Vegas, Nev. 89104

Continuation of Ser. No. 940,653, Sep. 8, 1978, abandoned, which is a division of Ser. No. 490,053, Jul. 19, 1974, Pat. No. 4,112,818, which is a continuation of Ser. No. 254,541, May 18, 1972, abandoned. This application Feb. 26, 1980, Ser. No. 124,747

Int. Cl.⁴ F41F *13/04*

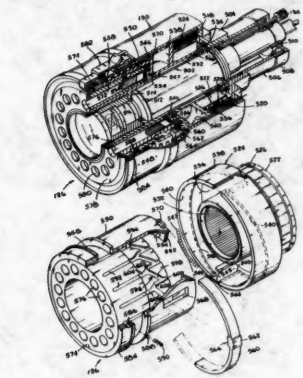
U.S. Cl. 42—65 **4 Claims**

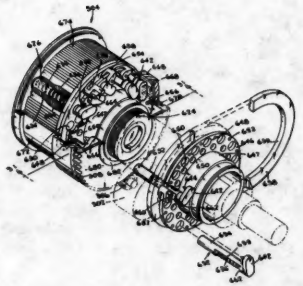
1. A generally annularly symmetrical multiple fire weapon which comprises unitary tubular barrel means having a series of annularly arranged, regularly spaced firing bores and respective cartridge chambers therein; tubular body means connected to said barrel means, firing pin means supported in said body means for axial firing movement relative to said barrel means, firing pin release means comprising rotatable ring means engaged with said firing pin means and incrementally rotatably shiftable in firing pin release increments to sequentially fire at least one of said bores at a time, and drive means operatively connected to said firing pin release means to incrementally rotatably shift said firing pin release means,

said firing pin means comprising a series of annularly arranged, regularly spaced firing pin members generally aligned with the respective bores, said firing pin members being released in rotational sequence to produce a generally helix firing pattern,

said weapon also comprising a series of annularly arranged, regularly spaced firing pin trip blocks engaged with the respective firing pin members to hold the firing pin mem-

bers in their cocked positions, said rotatable ring means having tripped means thereon sequentially engageable





with said trip blocks to release the firing pin members in rotational sequence.

4,617,751

FISHING TACKLE WITH A FIBER OPTIC LIGHT GUIDE AS THE FISHING LINE

Hakan Johansson, 159 Vintervägen, S-722 31 Västerås, Sweden

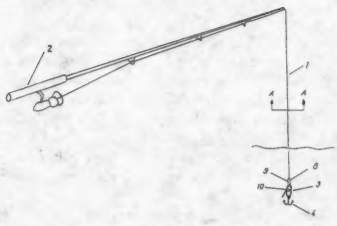
PCT No. PCT/SE84/00063, § 371 Date Oct. 18, 1984, § 102(e) Date Oct. 18, 1984, PCT Pub. No. WO84/03198, PCT Pub. Date Aug. 30, 1984

PCT Filed Feb. 23, 1984, Ser. No. 667,490

Claims priority, application Sweden, Feb. 25, 1983, 8301056

Int. Cl.[4] A01K *85/01, 91/00*

U.S. Cl. 43—17.5 **10 Claims**



1. A fishing tackle for catching fish, comprising a hand tool, a fishing line connected to the hand tool and a bait including an arresting member and connected to the fishing line, the fishing line comprising a least one light guide in the form of an optic connection between the hand tool and the bait for transmitting light to the bait to light up the same and comprising a core and a cladding, the core having a higher refractive index than the cladding, means for introducing light from a light source into the light guide at the hand tool, and coupling means connecting the light guide to the bait, the bait being capable of emitting light transmitted thereto from said light source via the light guide, said coupling means comprising at least two portions separable from each other, one portion being rigidly connected to the light guide and a second portion being rigidly connected to the bait.

7. A fishing tackle for catching fish, comprising a hand tool, a fishing line connected to the hand tool and a bait including an arresting member and connected to the fishing line, the fishing line comprising at least one light guide in the form of an optic connection between the hand tool and the bait for transmitting light to the bait to light up the same and comprising a core and a cladding, the core having a higher refractive index than the cladding, means for introducing light from a light source into the light guide at the hand tool, and coupling means connecting the light guide to the bait, the bait being capable of emitting light transmitted thereto from said light source via the light guide, said bait comprises at least one energy transformer including a photo-diode, for transforming light energy to electric energy, and at least one electric energy storage circuit comprising at least one capacitor.

4,617,752

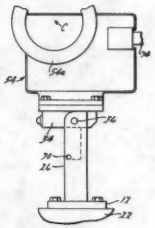
DOWNRIGGER MOUNTING

Alex Seres, Frankfort, Mich., assignor to Incoe Corporation, Troy, Mich.

Filed Mar. 20, 1985, Ser. No. 713,917

Int. Cl.[4] A01K *89/00*

U.S. Cl. 43—27.4 **8 Claims**



1. In a downrigger fishing apparatus of the type having separate reels for carrying a fishing line and a weighted-line respectively, the weighted-line reel having an axis of rotation.

mounting means for the reel that carries the weighted-line, said mounting means including

a standard adapted to be mounted at a convenient location on a boat, said standard having a stop, and locating means;

a post pivotally attached to said standard for pivotal movement between operative and inoperative positions, said pivotal movement being about an axis parallel to said weighted-line reel axis and provided with a spring loaded detent, and a mounting plate for the weighted line reel, said detent and said plate being mutually cooperative with said stop in a predetermined operative position of said post to hold the latter securely but releasably in said operative position, and said plate being additionally coactive with said locating means in a predetermined operative position of said post to dispose said post in said predetermined inoperative position.

4,617,753

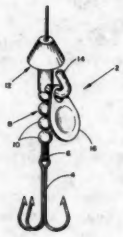
SPINNER BAIT COMPONENT SYSTEM

Gregory L. Pauley, P.O. Box 123, 208 Sioux St., Fort Peck, Mont. 59223, and Wayne V. Zahn, Minot, N. Dak., assignors to Gregory L. Pauley, Fort Peck, Mont.

Filed Feb. 8, 1985, Ser. No. 699,575

Int. Cl.[4] A01K *85/00*

U.S. Cl. 43—42.19 **12 Claims**



1. Fishing lure apparatus comprising:

a body member having forward and aft portions and a bore extending lengthwise therethrough, wherein said forward portion extends conically rearward to a surface of largest diameter and from which surface a cylindrical aft portion of smaller diameter extends and wherein said aft portion includes an integral arm projecting outwardly therefrom and such that a distal end thereof lies rearward in spaced apart relation to he forward portion's surface of largest diameter, said arm being deflectable to permit the securing of a fishing accessory thereover.

4,617,754

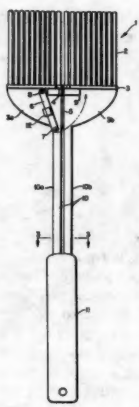
ARTICULATED FLY SWATTER

Steve Miley, P.O. Box 6653, Mesa, Ariz. 85206

Filed May 13, 1985, Ser. No. 732,853

Int. Cl.[4] A01M *3/02*

U.S. Cl. 43—137 **8 Claims**



1. A fly or insect swatter comprising:

handle means for holding the swatter,

flail means secured to said handle means for killing flies and insects,

said flail means comprising a plurality of spaced bristles arranged in a plane and connected to a flange means,

said flange means comprising two flange portions, and

pivot means interconnecting said flange portions for pivoting said flange portions, one relative to the other to assume a 90° degree configuration,

whereby the swatter can be used to kill flies or insects in corners.

4,617,755

APPARATUS FOR PLANT CULTIVATION

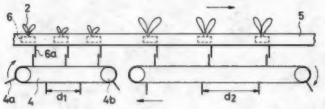
Akira Ikeda; Shigeki Nakayama; Toshitsugu Ishii, and Isao Itakura, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1984, Ser. No. 665,231

Claims priority, application Japan, Oct. 28, 1983, 58-203307; Oct. 28, 1983, 58-203315

Int. Cl.[4] A01G *31/02*

U.S. Cl. 47—65 **5 Claims**



1. A plant cultivating apparatus, comprising; a plurality of jigs, each for supporting a plant; a plurality of radially extending guide rails, each for movably supporting a predetermined number of said jigs; and a plurality of transporting means provided for each of said guide rails, said transporting means for each said guide rail being arranged in series along said guide rail, said transporting means moving relative to said guide rails, each said transporting means including a plurality of equidistantly arranged dogs said dogs engaging with and moving said jigs in a first direction along said guide rail, with a distance between adjacent ones of said dogs on one of said transporting means being identical to that of any other one of said transporting means arranged at a corresponding position along said guide rails, said distance being stepwisely increased with the distance from a starting end of said rail, with successive serial transporting means.

4,617,756

SWINGABLE SLIDING DOOR FOR A MOTOR VEHICLE UTILIZING A SWING ARM MOUNTED ON THE BODY OF THE CAR

Dietmar Dilcher, Vellmar, Fed. Rep. of Germany, assignor to Gebr. Bode & Co. GmbH, Kassel, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 716,049

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1984, 3411073

Int. Cl.[4] E05D *15/10*

U.S. Cl. 49—212 **13 Claims**

1. A swingable sliding door for a motor vehicle comprising a door panel movable between open and closed positions for a door opening in a vehicle body, a swing arm pivotably connected to the vehicle body, a carriage pivotably connected to said swing arm, an elongated support on said door panel, said carriage being slidably mounted on said support for undergoing slidable movement thereon as said door panel travels between said open and closed positions, said carriage comprising a sleeve, said elongated support comprising a bar slidably supporting said sleeve, and guide means connected to the door panel and to said swing arm for guiding the movement of the door panel between said open and closed positions, said guide

means being constructed so as not to bear any weight of the door, said carriage providing a support and guide function for the door panel such that the weight of the door panel is transmitted substantially from said bar through said sleeve to the swing arm.

4,617,757

SLIDING DOOR OPENING-CLOSING MECHANISM

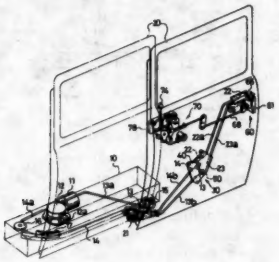
Tsutomu Kagiyama; Fumio Kobayashi; Jun Yamagishi, all of Kanagawa, and Hiromitsu Nishikawa, Yokohama, all of Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Oct. 31, 1985, Ser. No. 793,218

Claims priority, application Japan, Nov. 2, 1984, 59-231851; Nov. 2, 1984, 59-231852

Int. Cl.[4] E05F *15/00*

U.S. Cl. 49—280 12 Claims



1. An apparatus for opening and closing a sliding door mounted to a vehicle body, comprising a motor means fixedly mounted to said vehicle body for outputing power to move said sliding door, a linkage means secured to said sliding door for receiving said power from said motor, a door lock means having a latch means for completely closing said sliding door, said door lock means for receiving part of said power from said motor through said linkage means to lock and unlock said latch means, a first pair of cable means for transmitting said power from said motor to said linkage means, a second pair of cable means in correspondence with said first pair of cable means for transmitting said part of said power from said motor through said linkage means to said door lock means, and said linkage means being adapted to transmit said part of said power from said motor from each of said first pair of cable means to the corresponding one of said second pair of cable means and to take up slack in each of said first and second pairs of cables means when loosened.

4,617,758

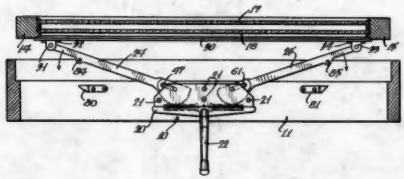
SELF-LOCKING WINDOW OPERATOR

Gregory J. Vetter, Owatonna, Minn., assignor to Truth Inc., Owatonna, Minn.

Filed Jan. 23, 1984, Ser. No. 572,827

Int. Cl.[4] E05F *11/00*

U.S. Cl. 49—324 12 Claims



1. A window operator for positioning a window sash relative to a window frame comprising, gear drive mechanism mountable on said window frame, an arm connected between said gear drive mechanism and said window sash and having rotational movement for moving the window sash and linear movement when the window sash is closed, and coacting locking means including a member on said arm and a member mountable on said window frame which are moved into locking relation by said linear movement of said arm.

4,617,759

PROFILE OF PLASTIC MATERIAL FOR REFRIGERATOR CABINETS

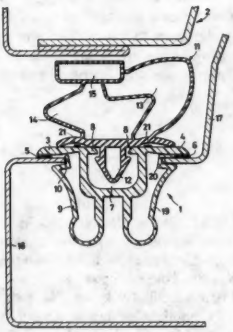
Bruno Pasqualini, Varese, and Adriano Merla, Angera, both of Italy, assignors to Pantasote Inc., Greenwich, Conn.

Filed Dec. 17, 1984, Ser. No. 682,099

Claims priority, application Italy, Dec. 23, 1983, 24029/83[U]; Dec. 23, 1983, 24030/83[U]

Int. Cl.[4] E06B *7/16*

U.S. Cl. 49—487 10 Claims



1. In a profile of plastic material for coupling the door shell and counterdoor of refrigerator and similar cabinets, comprising a bellows gasket portion which provides a tight seal between the door and the cabinet, the improvement wherein the profile and the gasket portion are integral and form only one piece produced by co-extrusion of two materials having a different rigidity such as to permit a ready detachment of the gasket portion, which is less rigid than the profile, from the profile along the region of their connection, under an appropriate manual or mechanical force, and wherein said profile has on its side facing the cabinet a pair of lateral ribs between which a groove is defined, suitable for receiving a substituting bellows gasket portion, and on its side facing the door at least one elastically yielding flange means, acting as a spring, for press (snap) coupling the door shell and the counterdoor in cooperation with said lateral ribs, said ribs operatively self-positioning relatively to the door shell and the counterdoor.

4,617,760

TABLE RECIPROCATING APPARATUS

Tetsuya Nagata, Narashino, Japan, assignor to Seiko Seiki Kabushiki Kaisha, Chiba, Japan

Filed Feb. 22, 1985, Ser. No. 704,383

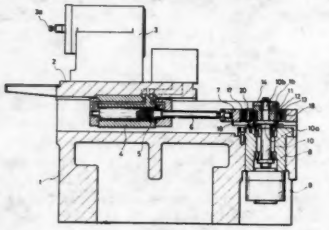
Claims priority, application Japan, Feb. 24, 1984, 59-25391[U]

Int. Cl.[4] B24B *9/00*

U.S. Cl. 51—34 C 5 Claims

1. A table-reciprocating apparatus comprising, in combination with a table disposed on a base for reciprocating movement in relation to the base: a shaft axially attached to said table; and a ring-like sliding member attached to the other end of the shaft for imparting reciprocating movement thereto and thereby to the table, said ring-like sliding member having interior surfaces defining an interior space, a drive shaft, and a

cam assembly disposed between the drive shaft and the sliding member for controlling the reciprocating movement of said member, said cam assembly comprising an inner cam axially connected to the drive shaft, and an outer cam disposed in the



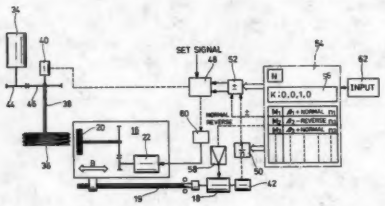
interior space of said ring-like sliding member in co-planar relationship, first bearing means interposed between the inner cam and the outer cam to transmit movement therebetween and second bearing means providing contact between the outer cam and the interior surfaces of the sliding member.

4,617,761

HELICAL GEAR GRINDING MACHINE

Satoshi Miyatake, Kawagoe; Mitsuo Abe, Kiyose, and Masao Kume, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 638,682
Claims priority, application Japan, Aug. 9, 1983, 58-146023
Int. Cl.[4] B24B *19/00*
U.S. Cl. 51—95 GH **11 Claims**



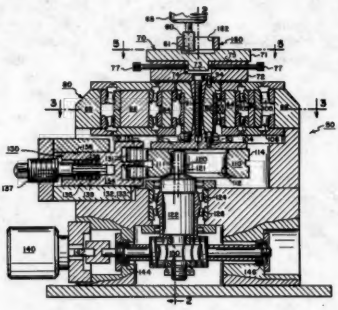
1. A helical gear grinding machine comprising:
(a) a first rotational drive source for rotating a grinding wheel;
(b) a first pulse generator operatively coupled to the grinding wheel;
(c) a second rotational drive source for rotating a helical gear in mesh with the grinding wheel;
(d) a third rotational drive source for displacing the helical gear with respect to the grinding wheel;
(e) a second pulse generator operatively coupled to said third rotational drive source for generating pulses dependent on the number of r.p.m. of said third rotational drive source; and
(f) memory means for storing division data of the helical gear wherein outputs of said memory means and outputs of said first pulse generator are added and subtracted to control the rotation of said second rotational drive source with pulses generated by said first pulse generator in grinding the helical gear with the grinding wheel.

4,617,762

CAM CONTROLLED MACHINE FOR FORMING NON-STANDARD SURFACES

Carl Hoglund, 58 Johnson Dr., Murray Hill, N.J. 07971

Filed Jul. 18, 1983, Ser. No. 514,512
Int. Cl.[4] B24B *17/02*
U.S. Cl. 51—101 R **7 Claims**



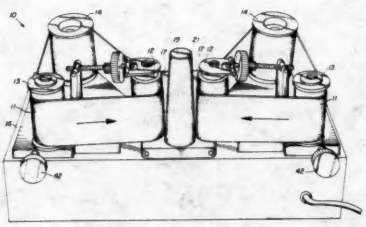
1. In a grinding machine comprising a grinding tool, a wortable on which a workpiece may be mounted for grinding, and a cam and a cam driver means for driving said worktable repeatedly through a path defined by said cam, apparatus for supporting said worktable comprising:
a spindle connected to said cam and said worktable, said spindle and the worktable connected thereto being moved repeatedly through said path by action of said cam and cam driver means, and
first, second and third annular support means that are nested together with the spindle inside the first support means, the first support means inside the second and the second support means inside the third,
said spindle and said first and second support means being mounted for rotation about a spindle axis, a first axis and a second axis of rotation, respectively, said spindle axis, first axis, and second axis being parallel to one another and spaced apart from each other, said first and second support means rotating with respect to each other about said first and second axes of rotation, respectively, as a result of translational motion imparted to said spindle by action of said cam and cam driver means.

4,617,763

BELT DRIVEN KNIFE SHARPENER

Theodore L. Edling, 4333 Willow Rd., Bethel Island, Calif. 94511

Filed Jul. 19, 1984, Ser. No. 632,376
Int. Cl.[4] B24B *21/00*
U.S. Cl. 51—135 R **5 Claims**



1. A knife sharpener, comprising:
a base;

a pair of grinding belts and at least two rollers supporting each of the grinding belts, the rollers supported on the base for rotation about vertical axes;

motor means connected to the base and driving one of the rollers on each grinding belt such that the belts rotate in opposite directions;

one roller of each belt being a support roller for knife sharpening, the two support rollers being spaced apart with a guide roller between them, the guide roller being rotationally supported on the base on a vertical axis and closely adjacent to the grinding belt at each support roller to define a narrow crevice means on each side of the guide roller for receiving a knife blade in generally horizontal orientation perpendicular to the axes of rotation of the guide roller and the support roller and twisted about a longitudinal axis of the blade to engage an upper edge of the knife blade against the guide roller and force the cutting edge of the blade against the belt; and

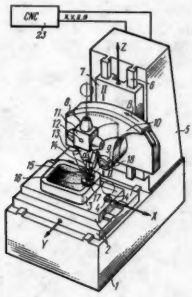
each support roller and the guide roller including resilient cushioning sleeve means for enabling local deformation of one support roller and the guide roller by a knife blade twisted therebetween, to permit a manually adjustable degree of twisting of the knife blade and to control the degree of twisting of the knife blade in the crevice so that the depth of grinding of the cutting edge is controlled by the amount of twisting force applied to the blade as the blade is pulled horizontally through the crevice.

4,617,764

NC VERTICAL SPINDLE JIG GRINDER

Judel S. Reibakh, Moscow, U.S.S.R., assignor to Experimentalny Nauchno-Issledovatelsky Institut Metallorezhuschikh Stankov, Moscow, U.S.S.R.

Filed May 23, 1985, Ser. No. 737,190
Int. Cl.[4] B24B *53/14*
U.S. Cl. 51—165.71 **4 Claims**



1. A numerically controlled substantially upright spindle jig grinder arrangement, comprising

a bed;

a compound table carrying a workpiece traversable on said bed in a substantially horizontal plane along at least two axes independent from each other;

a column rigidly attached to the bed, said column having at least one first guide means positioned in a substantially upright direction;

slide means movable along said first guide means in the direction of a third axis;

said slide means having at least one second guide means having arc-shaped configuration;

said slide means having a lay-shaft;

base means movable on said second guide means relative to an axis of said lay-shaft along an arc shaped coordinate axis;

receiving means positioned on said base means indexable about an axis of said receiving means;

said receiving means having at least two wheelheads,

longitudinal axes of said wheelheads laying in planes substantially perpendicular to the plane of the axis of said receiving means

a wheel spindle of each said wheelheads has an axis interposed at a predetermined angle to the axis of the wheelhead; said wheel spindle rotating during machining of the workpiece about the longitudinal axis of said wheelhead;

a spherical abrasive tool positioned on said wheel spindle; a geometrical center of said spherical abrasive tool lying on the geometrical axis of rotation of said base means; the grinding allowance being removed from the workpiece when the spherical abrasive tool rotates about the axis of said wheel spindle;

a wheel dresser located on said compound table; said wheel dresser traversing together with said compound table relative to said base means to a position at which said wheel dresser is situated on the line of intersection of a vertical plane passing through the lay-shaft axis with the horizontal surface of said compound table when the spherical abrasive tool is being formed and dressed;

forming and dressing of the surface of the spherical abrasive tool occur when said slide means traverses rotation of said spherical abrasive tool and oscillations of said base means moves through a preset angle depending on the shape and dimensions of a spherical layer of the abrasive tool; and

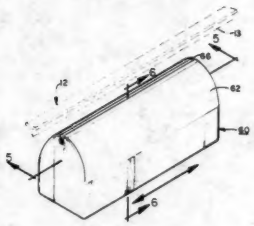
numerically controlled system electrically connected to said jig grinder arrangement.

4,617,765

WIPER BLADE EDGER

Robert M. Weiler, Feasterville, Pa., assignor to Joe O'Donnell, Philadelphia, Pa., a part interest

Continuation-in-part of Ser. No. 297,425, Aug. 26, 1981, abandoned. This application Nov. 29, 1983, Ser. No. 556,179
Int. Cl.[4] B24D *15/02*
U.S. Cl. 51—205 WG **3 Claims**



1. An edger for manually refurbishing a wiper blade of elastomeric material, the wiper blade having a cross-section of decreasing width toward a working edge, the blade adapted to be wiped transversely over a surface, the edger comprising:

an elongated housing to be grasped by a user, the housing being at least partly hollow and having an external portion with at least one groove along its entire length, the groove having rigid, non-abrasive side walls, the groove having a width substantially the same as the working edge of said blade;

the housing having an internal portion received within the external portion, the internal portion having a surface disposed immediately below the groove, the internal portion being dimensioned to fit tightly into the external portion through a transverse opening extending along the external portion at a side of the housing opposite the groove;

an abrasive member disposed in the housing below the groove, the abrasive member being wider than the groove

and fixed in place on said surface disposed immediately below the groove, the abrasive member extending along the length of the housing, the abrasive member being aligned to remove material transverse and perpendicular to the blade as the edger is passed along the working edge, the groove maintaining a blade position perpendicular to the groove,; and,

the external portion and the internal portion both being substantially U-shaped in cross-section, each U-shaped portion having legs and a base, the base of the internal portion being flattened and supporting the abrasive member immediately below the groove, the external portion having interengaging press-fit means for engaging the internal portion, the groove being formed along the length of the base of the external portion and the abrasive member being affixed between the base of the internal portion and the base of the external portion, the external portion being engaged by ends of opposite legs of the U-shaped internal portion, the ends of the legs being frictionally disposed against inward sides of the U-shaped portion.

4,617,766

GRINDING WHEEL FOR FLAT PLATES

Shinji Sekiya, Tokyo, and Takatoshi Ono, Nagareyama, both of Japan, assignors to Disco Co., Ltd., Tokyo, Japan

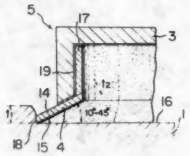
Continuation of Ser. No. 523,825, Aug. 15, 1983, Pat. No. 4,545,154, which is a continuation of Ser. No. 212,305, Dec. 3, 1980, Pat. No. 4,411,107. This application Jun. 26, 1985, Ser. No. 749,043

Claims priority, application Japan, Feb. 1, 1980, 55-10888; Feb. 1, 1980, 55-10889

The portion of the term of this patent subsequent to Oct. 25, 2000, has been disclaimed.

Int. Cl.[4] B24D *5/00*

U.S. Cl. 51—209 R **7 Claims**



1. A grinding wheel comprising a cup and at least one grindstone provided at an open end of said cup, said grindstone having means for grinding a flat surface of a hard and brittle workpiece in a cutting manner, said means being an annular grinding portion which protrudes radially outwardly from the open end of said cup with inclination relative to the central axis of said cup, a substantial fraction of the width of said grindstone being cantilevered out from said cup, such that the radially inner and outer portions of the width of said grindstone are respectively backed by and free of backing by said cup, means for simultaneously minimizing risk of breakage of the grinding portion and overheating of said hard and brittle material being ground, said means comprising (1) a grindstone composition of electrodeposited super hard abrasive grains with at least said radially outer portion of the width of said grindstone not including any substrate or other backing and (2) a grinding portion thickness in the range of 0.1 to about 0.5 mm, whereby said grinding portion is sufficiently thin to grind the flat surface in a cutting manner efficiently and accurately.

4,617,767

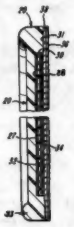
SANDING, BUFFING AND POLISHING TOOL AND PARTS THEREOF

Frank F. Ali, 2855 Locke Dr., Beavercreek, Ohio 45324

Filed Jan. 14, 1985, Ser. No. 691,018

Int. Cl.[4] B24D *17/00*

U.S. Cl. 51—358 **9 Claims**



2. Apparatus for use in providing a sanding, buffing and polishing tool comprising a disc forming a back-up pad for abrasively surfaced sheet material the outermost face of which presents a sanding, buffing and/or polishing surface, said disc having a front face and a rear face, said front face having the major extent of its surface recessed relative to a relatively narrow bounding outer peripheral portion thereof to define therein a central cavity having a base which is surfaced by material including outwardly directed hook formations projected to a location immediately of a plane defined by said relatively narrow bounding outer peripheral surface portion of said front face of said disc.

4,617,768

POLESHAPED SUPPORTING MEMBER, AND BASE STRUCTURE FOR ATTACHMENT OF SAME

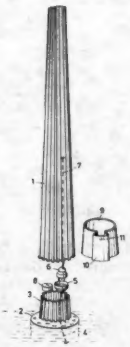
Sven Runo V. Gebelius, Box 15008, Bromma, Sweden (S-161 15)

PCT No. PCT/SE83/00376, § 371 Date Jun. 20, 1985, § 102(e) Date Jun. 20, 1985, PCT Pub. No. WO85/01977, PCT Pub. Date May 9, 1985

PCT Filed Nov. 1, 1983, Ser. No. 755,334

Int. Cl.[4] E04H *12/08*

U.S. Cl. 52—40 **10 Claims**



1. A support structure comprising:

a poleshaped member having a tubular cross-section, said poleshaped member having an inner surface and an outer surface;

said poleshaped member having a conically reduced cross-section in direction from a ground plane;

a base structure;

an attachment member adapted to be detachably secured to said poleshaped member;

said attachment member having an external shape substantially corresponding to said inner surface of said poleshaped member;

at least one clamping member surrounding said poleshaped member adapted to press a portion of said poleshaped memeber surrounding said attachment memeber into a frictional contact position against said attachment member;

a first electrical connection member disposed adjacent to an upper plane of said attachment member, said first electrical connection member being joined to an electric feed cable; a second electrical connecting member being disposed to a larger end portion of said poleshaped member, and being joined to a cable;

said cable being disposed within said poleshaped member;

said first and second connecting members being electrically interconnectable to supply voltage to an electric fitting suspended by said poleshaped member.

4,617,769

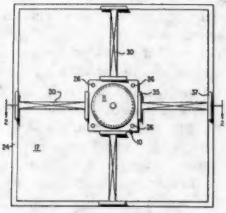
ASEISMIC BEARING FOR BRIDGE STRUCTURES

Edward R. Fyfe, 3058 Eva Drive, Burlington, Ontario, Canada; William M. Slater, 21 Garfield Ave., Toronto, Ontario, Canada (M4T 1E6), and Ronald J. Watson, 199 Sherbrooke, Williamsville, N.Y. 14221

Filed Feb. 24, 1984, Ser. No. 583,542

Int. Cl.[4] E02D *27/34*

U.S. Cl. 52—167 **11 Claims**



1. An aseismic bridge bearing comprising:

a first plate, a second plate, a resilient member sandwiched between the first and second plates to permit vertical and horizontal movement between the first and second plates, and a locating pin between the resilient member and one of the first and second plates;

an aseismic couple plate secured by first anchor pins to one of a bridge pier and a bridge deck, the first plate being secured to the other of the bridge pier and bridge deck and the second plate being adjacent and parallel to the couple plate; and

a fuse pin between the second plate and the couple plate such that during normal operating conditions movement between the bridge deck and bridge pier will be accommodated by the resilient member; however, during seismic activity excessive horizontal displacement will cause rupturing of the fuse pin and permit sliding to occur between the second plate and the couple plate.

4,617,770

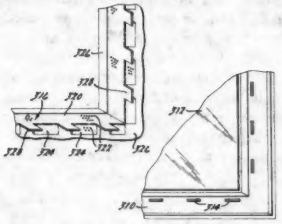
NAILERLESS ROOF EDGE, FRAMING STRUCTURE AND BUILDING PANEL MOUNTING ASSEMBLY

John B. Hickman, Asheville, N.C., assignor to W. P. Hickman Co., Asheville, N.C.

Continuation-in-part of Ser. No. 534,268, Sep. 22, 1983, Pat. No. 4,472,913, which is a continuation of Ser. No. 191,714, Sep. 28, 1980, abandoned. This application Sep. 25, 1984, Ser. No. 654,647

Int. Cl.[4] E06B *2/04*; E04B *5/52*

U.S. Cl. 52—214 **17 Claims**



1. In a kit for an assembly for mounting a framing member to a building at an opening through a surface of the building, the building surface generally defining an outwardly facing plane, comprising:

a tab strip member having an attachment portion for securing to said building adjacent said opening and having tab means integral with said attachment portion;

said tab means extending outwardly from and orthogonally to the plane of said building surface when said tab strip member is secured to said building;

a frame member having integrally formed slot means for receiving said tab means by sliding said frame member in a direction orthogonal to the plane of said building until a portion of said tab means protrudes through said slot means;

said frame member being supported by said tab means when slidably received by said tab means and said tab means being permanently bendable to prevent removal of said frame member; and

cover member attachable to an outwardly exposed portion of said frame member for concealing said protruding portion of said tab means.

4,617,771

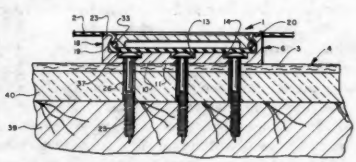
MECHANICAL FASTENER FOR ROOFING MEMBRANE AND METHOD OF APPLYING SAME

Walter Tomaszewski, Canton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 26, 1985, Ser. No. 780,862

Int. Cl.[4] E04D *5/14*

U.S. Cl. 52—410 **18 Claims**



1. A mechanical fastener securing a flexible elastomeric sheet to the upper surface of a roof, said fastener including:

(a) a rigid housing secured to the upper surface of the roof and underlying the elastomeric sheet, said housing having an upstanding annular-shaped boss with an annular-

shaped ledge formed integrally with and extending radially inwardly from said boss to form an undercut circular recess;

(b) fastening means securing the housing to the upper surface of the roof;

(c) a separate elastic ring split at one location on its circumference mounted within the annular-shaped boss of the housing clamping the elastomeric sheet against the housing in the undercut circular recess between the elastic ring and ledge; and

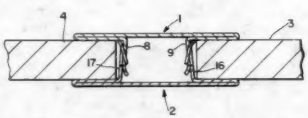
(d) a locking cap mounted on the housing by a snap-fit engagement, said cap having an annular-shaped side wall, with an undercut recess formed in an outer surface of said wall, said recess having a diameter at least equal to or greater than the unstressed diameter of the elastic ring, said cap side wall being inserted within the annular-shaped wall of the housing and engaging the elastic ring within the undercut recess of the cap, thus maintaining said ring in clamping engagement with the elastomeric sheet and within the undercut circular recess of the housing.

4,617,772

WALL PANEL JOINER

George Hassell, Coral Springs, Fla., assignor to Jamestown Metal Marine Sales Inc., Boca Raton, Fla.

Filed Jun. 12, 1984, Ser. No. 619,983
Int. Cl.[4] E04C *1/34*
U.S. Cl. 52—461 **5 Claims**



1. A clamping means for securing two wallboards together to form part of a wall, said clamping means comprising a pair of clamping elements including

a first clamping element having a first flat face and a pair of first spaced flanges extending at right angles to said first flat face, said first flanges being disposed in spaced relation to the longitudinal edges of said first flat face,

a second clamping element having a second flat face and a pair of second spaced flanges extending at right angles to said second flat face, said second flanges being disposed in spaced relation to the longitudinal edges of said second flat face, the distance between each second flange and the adjacent longitudinal edge of said second flat face being slightly greater than the distance between each first flange and the adjacent longitudinal edge of said first flat face so that the flanges of the second clamping member fit within the flanges of the first clamping member with the flanges on said first and second clamping members being in face to face contact with each other,

and means for locking said clamping elements together and permitting release of such elements only by longitudinal sliding movement of one element with respect to the other element,

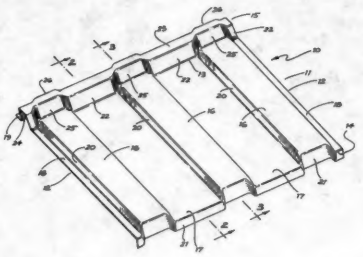
said locking means comprising slots on the flanges of one of said clamping elements and tabs extending from the flanges of the other of said clamping elements, said tabs being disposed within said slots when said clamping elements are locked together so that one edge of each of the slots is disposed between the inner face of each of the tabs and the surface of the flange of said other clamping element, the peripheral surface of said tabs being disposed at an angle to provide cam means to permit small longitudinal movement of said clamping elements to release the interlocked clamping elements.

4,617,773

CLADDING ELEMENT

Kevin A. R. Studwell, Sunnybank, Australia, assignor to Australian Design Marketing Pty. Ltd., Sunnybank, Australia

Continuation-in-part of Ser. No. 566,326, Dec. 28, 1983, abandoned. This application Mar. 6, 1986, Ser. No. 836,981
Int. Cl.[4] E04D *1/00*
U.S. Cl. 52—537 **10 Claims**



1. A sheet metal cladding element which is intended in use to span and to be secured to at least two structural members of a building, the cladding element comprising:

a panel portion having opposed side edges and opposed top and bottom edges extending in a lateral direction between the side edges,

an inverted channel-shaped ridge extending along the top edge of the panel portion and formed integrally with the panel portion, the ridge being connectable to the building structural members by fasteners and, when so connected, functioning to tie the members together, and the ridge including an inner wall which forms an upwardly projecting extension of the panel portion,

a plurality of upwardly projecting, inverted channel-shaped ribs formed in the panel portion and extending along the panel portion from the inner wall of the ridge in a direction toward the bottom edge of the panel portion,

a series of recesses formed in the inner wall of the ridge, the recesses serving to enhance the structural integrity of the cladding element and providing for merging of the ribs with the inner wall of the ridge,

each recess being in alignment with a respective one of the ribs, having a width equal to that of the rib and defining a cavity into which the associated rib extends, and

a downwardly projecting lip formed at and extending along the bottom edge of the panel portion,

the cladding element being arranged to locate in overlapping relationship with adjacent cladding elements, with a rib of one element being nested below a rib of a laterally adjacent element and with the lip at the bottom edge of one element extending over the ridge at the top edge of another of the elements.

4,617,774

BUILDING PANEL

Raymond H. Pittman, Batavia, and William J. Schultz, St. Charles, both of Ill., assignors to Masonite Corporation, Chicago, Ill.

Filed Jul. 11, 1984, Ser. No. 629,625
Int. Cl.[4] E04D *1/00*
U.S. Cl. 52—521 **14 Claims**

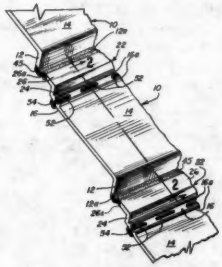
1. A building panel for exterior and interior wall and roof surfaces comprising:

an elongated body formed of relatively thins, hardboard material, having upper and lower edges, a molded outer face adapted for exposure to the weather, and a back face opposite said outer face and having contour generally matching that of said outer face;

said body including a lower edge portion extending along a

lower edge of said panel integrally joining an intermediate facia portion spaced outwardly of said lower edge;

an elongated fastener receiving strip integrally joining an upper edge of said intermediate facia portion and including a plurality of longitudinally spaced apart, integrally molded, fastener receiving depressions projecting inwardly from the intersecting surface of said outer face immediately adjacent an edge of said depressions, each of said depressions having an inwardly sloping wall surface with a depth greater than the nominal thickness of said panel between said outer face and said back face, said



depressions aligned in a row on said strip between said upper and lower edge of said panel, said strip having a machined back surface comprising a portion of said panel back face formed by machining after said depressions have been formed in said panel, said machined back surface having a generally planar face intersecting said sloping wall surface of each depression thereby forming an open slot for receiving a fastener extending completely through said panel between said outer and back faces thereof; and

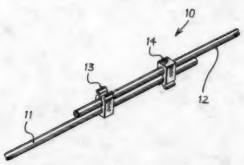
an upper edge portion joining an upper edge of said fastener receiving strip adapted to underlie a lower edge portion of a panel laid up in a next higher course.

4,617,775

EXTENSIBLE REINFORCING BAR ASSEMBLY AND CLIP

John Padrun, 22800 Hutchinson Rd., Los Gatos, Calif. 95030

Filed Sep. 4, 1984, Ser. No. 647,045
Int. Cl.[4] E04C *5/20*
U.S. Cl. 52—684 **2 Claims**



1. An extensible reinforcing bar assembly for use in reinforcing concrete comprising first and second cylindrical reinforcing bars, a plurality of clips retaining said bars in parallel relation, one end portion of said first bar lying alongside a length of the other said bar intermediate the ends thereof so as to combine the overall length of both bars in extensible relation therebetween, said clips including a U-shaped plastic unit formed to be forced onto said first and second said bars, said unit including a force-receiving web at one end, said web carrying elongate confronting spaced apart side panels, said panels having first and second pairs of relieved surface portions disposed in confronting relation to form first and second seats for holding said bars tightly and independently therebetween, the confronting surfaces of each of said seats including portions disposed to underlie an associated one of said bars seated therein, said confronting surfaces being disposed to substantially meet at the free end of said panels when no bar is seated in said clip, said side panels having limited resilience serving to tightly engage the sides of said bars therebetween while permitting said bars to be longitudinally adjusted to provide the desired combined length of said assembly, the exterior region laterally to the sides of said clips being free of protuberances therefrom.

4,617,776

BUILDING ELEMENT HAVING SPACED LONGITUDINAL MEMBERS WITH EACH MEMBER HAVING A DIFFERENT MOISTURE CONTENT

Ulf Bergström, Bromölla, Sweden, assignor to Armerad Betong Vagforbattringar AB, Stockholm, Sweden

PCT No. PCT/SE82/00126, § 371 Date Dec. 17, 1982, § 102(e) Date Dec. 17, 1982, PCT Pub. No. WO82/03646, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 22, 1982, Ser. No. 456,080
Claims priority, application Sweden, Apr. 23, 1981, 8102568
Int. Cl.[4] E04C *3/30, 3/36*
U.S. Cl. 52—690 **5 Claims**

1. A prefabricated building element comprising

two substantially parallel, spaced longitudinal members; and

at least one spacer and connecting means disposed between and connected to the longitudinal members;

wherein at least said longitudinal members of said prefabricated element, in order to compensate for expected climatic differences at opposite sides of the building element in the position of use in a building structure, are comprised of hygroscopic material,

wherein each of said members has a moisture content that is different from moisture content of the other member in said element at the time of production,

and wherein the moisture contents of the members are in a moisture ratio, said moisture ratio being the expected moisture ratio between the members when the building element is exposed to two different climatic conditions in the position of use in the building structure.

4,617,777

DOUBLE-WALLED PANELS WITH END CLOSURE

Gunnar J. Fonne, Eidanger; Finn Daae-Johansen, Tjodalyng; Per Thoresen, and Stein-Arne Nilsen, both of Oslo, all of Norway, assignors to Vefi A/S, Larvik, Norway

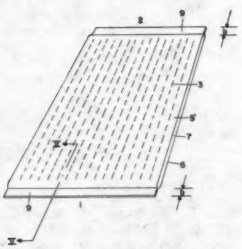
PCT No. PCT/NO83/00047, § 371 Date Jul. 3, 1984, § 102(e) Date Jul. 3, 1984, PCT Pub. No. WO84/01687, PCT Pub. Date May 10, 1984

PCT Filed Nov. 4, 1983, Ser. No. 629,550

Claims priority, application Norway, Nov. 4, 1982, 823664

Int. Cl.[4] E04C *2/54*

U.S. Cl. 52—802 2 Claims



1. A double-walled panel formed of transparent synthetic material and for use in greenhouses and for similar purposes, said panel comprising:

a pair of sheets of transparent synthetic material, each said sheet having opposite ends;

a plurality of parallel ribs of transparent synthetic material positioned between said pair of sheets and defining therewith a plurality of longitudinal channels extending between opposite ends of said panel; and

said ends of said sheets at each said panel end extending beyond respective ends of said ribs and being joined to form a flange extending transversely of said channels and closing said panel end, with said rib ends spaced from said closed panel end and thereby defining holes connecting adjacent ends of all of said channels.

4,617,778

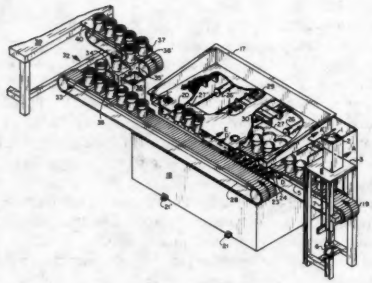
APPARATUS TO FACILITATE HAND PACKING OF CONTAINERS

Kent G. Blackman, Sycamore, Ill., assignor to The Suter Company, Inc., Sycamore, Ill.

Filed Dec. 19, 1985, Ser. No. 810,773

Int. Cl.[4] B65B *67/02*

U.S. Cl. 53—391 15 Claims



1. Apparatus to facilitate the manual filling of a plurality of containers with a product, said apparatus comprising:

a continuously operating in-feed conveyor;

a container dispenser station periodically operated to dispense containers onto said in-feed conveyor;

a plurality of transfer rails positioned adjacent to said in-feed conveyor;

operating means;

at least one shuttle bar operated in response to an initial manual operation of said operating means to move a first plurality of said containers from said in-feed conveyor onto said transfer rails;

a filler plate, including a plurality of openings therein, said plate supporting a quantity of said product;

said openings in said plate being positioned over said transfer railings and over said containers thereon;

at least one clamp saddle initially positioned below said transfer rails and operated in response to said initial manual operation of said operating means to move said plurality of containers on said transfer rails, off of said rails and upward against said filler plate;

whereby said product can be manually introduced from said plate into said plurality of containers and said containers are filled.

4,617,779

METHOD AND AN ARRANGEMENT FOR THE MANUFACTURE OF PACKING CONTAINERS

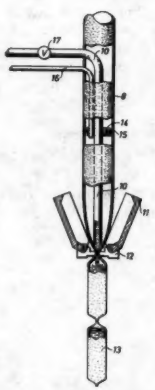
Jan Nygren, Lund, and Anders Hilmersson, Helsingborg, both of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Filed Sep. 9, 1983, Ser. No. 530,604

Claims priority, application Sweden, Sep. 27, 1982, 8205494

Int. Cl.[4] B65B *31/00*

U.S. Cl. 53—433 11 Claims



1. A method for manufacturing and filling packing containers comprising the steps of:

advancing a continuous web of packing material in a predetermined direction;

forming said web into a tube and sealing said web longitudinally at a first location while said web advances;

conducting a liquid material through a fill pipe from above said first location;

continuously conducting gas through a gas pipe from above said first location;

sealing the tube at a zone transverse to said predetermined direction, the zone constituting a bottom of a packing container;

establishing a greater gas pressure inside said tube between said first location and said zone from gas conducted through said gas pipe;

feeding said liquid material to be packaged into the tube to a predetermined level;

applying forming jaws against the exterior of said tube after said liquid material to be packaged is fed into the tube to produce flattened sides of a predetermined shape of a packing container;

sealing said portion of said tube at a zone transverse to said predetermined direction and above the level of contents.

7. An apparatus for manufacturing and filling packing containers comprising:

means for advancing a continuous web of packing material in a downward vertical direction;

forming means for forming said web into a tube;

seam sealing means for sealing together the longitudinal edges of said web at a first location while said tube advances;

bottom sealing means for sealing said tube at a first transverse zone thereof so as to form a bottom of a packing container, said first location being spaced vertically above said first transverse zone;

a first feed pipe for feeding a liquid to be packaged into said tube, said first feed pipe extending vertically from a location above said first location;

seal means between said first location and said transverse zone for providing a seal between the interior tube wall and said first feed pipe;

a second feed pipe for continuously supplying a pressurized gas to the interior of said tube, said second feed pipe extending vertically from a location above said seal means and through said seal means;

shaping means for shaping said tube below said first location into a packing container of desired shape while the interior of the tube is pressurized and filled with the material to be packaged; and

top sealing means for sealing said tube at a second transverse zone spaced above said first transverse zone, whereby the shape of said tube is maintained by the gas pressure during operation of said shaping means.

4,617,780

METHOD AND APPARATUS FOR WRAPPING CIGARETTE PACKETS IN FILM BLANKS

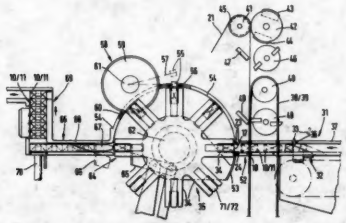
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Aug. 29, 1984, Ser. No. 645,187

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1983, 3332950

Int. Cl.[4] B65B *11/00*

U.S. Cl. 53—466 **5 Claims**



1. A method of wrapping packets (**10**, **11**) in blanks which are first folded in a U-shape around the packets and thereafter completely folded around the packets to encase them in the blanks, each of said packets having front and rear faces (**12**, **13**,) a pair of lateral end faces (**14**, **15**) and a pair of longitudinal faces (**16**, **17**), comprising the steps of:

simultaneously forwardly moving along a first path at least two packets lying adjacent to each other with a preselected space therebetween such that a lateral end face of one packet is spaced, in a direction perpendicular to said first path, from a lateral end face of an adjacent packet;

feeding, along a path in a plane perpendicular to said first path and to a position intersecting said first path, a common, overall blank (**18**) of sufficient size to wrap at least two adJacent packets;

moving said at least two adjacent packets against said blank to cause folding of said blank around said at least two adjacent packets such that the blank has a U-shaped portion extending in a first direction parallel to the lengths of the longitudinal faces of adjacent packets and across said space, and in a second direction rearwardly over and beyond the front and rear faces of adjacent packets to form upper and lower tube flap portions (**23**, **24**);

prior to said last moving step, forming a preliminary cut (**29**) in the portion of the blank covering the space between two adjacent packets to define the edges of future inner lateral end flap portions (**27**) facing said space;

moving said common blank against stationary fingers to fold said inner lateral end flap portions (**27**) and outer lateral end flap portions (**28**) against said laterla end faces (**14**, **15**), respectively;

then connecting said upper and lower tube flap portions together to form a tubular shaped blank; and

then, cutting along said preliminary cut (**29**) in the remaining portion of the blank (**18**) covering the space between two adjacent packets to sever said common blank (**18**) and to form first and second tubular shaped blank sections surrounding respective packets, and then folding remaining longitudinal and lateral end flap portions (**25**, **26**, **30**) of the blank against the respective lateral end faces of each of said respective packets.

4,617,781

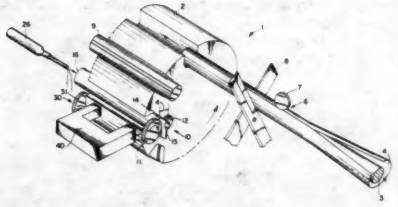
POLYPROPYLENE WRAP END SEALS AND PROCESS FOR MAKING SAME

Willard A. Ingersoll, Wyoming; Robert C. Norquest, Dover, and Richard A. Weber, Smyrna, all of Del., assignors to International Playtex, Inc., Stamford, Conn.

Filed Dec. 12, 1984, Ser. No. 680,698

Int. Cl.[4] B65B *7/06, 51/16, 7/18*

U.S. Cl. 53—477 **17 Claims**



1. A process for sealing an end of a voided polypropylene film wrap comprising the steps of:

(a) inserting said end of said polypropylene wrap between a 50 pitch knurl wheel and a 50 pitch idler wheel;

(b) pressing at least one of said knurl and idler wheels against said polypropylene wrap and said other wheel so as to effect a mechanically crimped seal; and

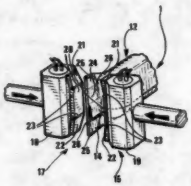
(c) heating said knurl wheel prior to and during said pressing step (b) to a temperature from 110° F. to 140° F. in order to increase the flexibility of said polypropylene wrap but not form a heat seal.

4,617,782

METHOD FOR WRAPPING BATCHES OF STACKED PRODUCTS SO AS TO FORM SEALED PACKETS

Riccardo Mattei, and Roberto Natali, both of Bologna, Italy, assignors to G. D. Società per Azioni, Bologna, Italy

Filed Jun. 8, 1984, Ser. No. 618,947
Claims priority, application Italy, Jun. 14, 1983, 3460 A/83
Int. Cl.[4] B65B 7/08, 11/32
U.S. Cl. 53—479 1 Claim



1. Method for wrapping a batch of stacked products so as to form a sealed packet, the steps comprising:

folding a sheet of heat-sealing wrapping material, of a length greater than that of the batch and a width greater than the periphery of the batch, in U fashion around the batch to leave two juxtaposed borders of the sheet extending the length, and beyond the ends, of the batch;

welding, one to the other, the two borders of the sheet so as to provide a longitudinal sealing rib and to form the sheet into a tube having ends protruding beyond the ends of the batch;

flattening the ends of the tube;

sealing at least part of each of the flattened ends by moving together opposing heating jaws each having a central part separated by gaps from two lateral parts and welding the flattened ends corresponding to said central and lateral parts while leaving weakened folding lines sealed to a lesser extent corresponding to said gaps to define a sealed central part and two sealed lateral flaps at each end; and

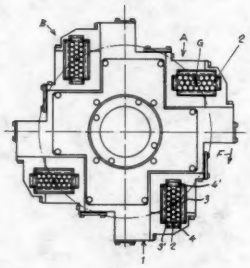
folding the central part against the corresponding end of the batch and then folding the flaps along said weakened fold lines against the folded central part.

4,617,783

COMPRESSION DRUM FOR CIGARETTES

Renato Manservisi, Bologna, Italy, assignor to SASIB S.p.A., Bologna, Italy

Filed Jul. 11, 1985, Ser. No. 754,451
Claims priority, application Italy, Jul. 18, 1984, 12566 A/84
Int. Cl.[4] B65B 13/20
U.S. Cl. 53—529 8 Claims



1. A rotatable compression drum for orderly groups of cigarettes in automatic cigarette-packing machines, comprising:

a compression pocket having a substantially rectangular cross-section and including a pair of longer sidewalls that are disposed opposite each other and that correspond to the longer sides of the rectangular cross-section of the pocket and a pair of shorter sidewalls that are disposed opposite each other and that correspond to the shorter sides of the rectangular cross-section of the pocket, at least one longer sidewall and at least one shorter sidewall being separate from each other and the remaining sidewalls and being independently movable toward and away from the respective opposite sidewalls; and

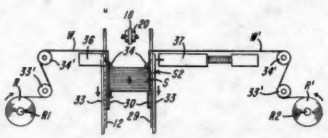
actuating means operatively connected to said at least one longer sidewall and at least one shorter sidewall for permitting the cross-section of the pocket to be modified between a maximum expansion condition, wherein an orderly group of cigarettes to be packed is introduced into the pocket, and a maximum compression condition, wherein the group of cigarettes received in the pocket is compressed, said actuating means causing one pair of opposite sidewalls to approach each other and thereafter causing the other pair of opposite sidewalls to approach each other, wherein for each pair of opposite sidewalls said actuating means includes a respective cam follower that is movably mounted in the drum and that is operatively connected to at least one of the respective opposite sidewalls, and a respective fixed cam that is co-axial with the drum and that cooperates with the respective cam follower, wherein one cam follower is disposed upstream of the pocket and the other cam follower is disposed downstream of the pocket with respect to the direction of rotation of the drum, and wherein the cam followers are slidably but not rotatably mounted in the drum substantially radially thereto and are perpendicular to each other and the respective pair of opposite sidewalls.

4,617,784

APPARATUS FOR STACKING AND BANDING TAGS

Roman M. Golicz, Clinton; Dana W. Seniff, Guilford, both of Conn.; Ronald L. Fogle, Lebanon, and Orville C. Huggins, Dayton, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 568,555, Jan. 5, 1984, abandoned. This application Dec. 23, 1985, Ser. No. 815,182
Int. Cl.[4] B65B 9/02, 35/50
U.S. Cl. 53—540 1 Claim



1. Apparatus for banding tags, comprising: means for conveying tags serially to a stacking station, the conveying means including a conveyor for moving the tags in a first direction, means for interrupting the movement of the tags as they arrive at the stacking station to provide a tag stack, means providing a path for the first web of banding material to the stacking station, means providing a path for a second web of banding material to the stacking station, means including a transferring member for simultaneously moving the entire tag stack in a second direction across the paths of said first and second webs to a banding station to thereby wrap said stack with said webs, means for attaching the first band to the second band at spaced locations to provide a band about the stack to keep the tags stacked, wherein the band attaching means includes a stationary jaw and a movable jaw cooperable with the stationary jaw, at least one of the jaws having means for heat sealing and

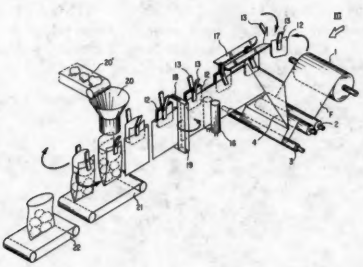
weakening the first and second webs between a series of tag stacks, means for moving the transferring member and thereby the stack from a first position in said stacking station to a second position in said banding station including a first single revolution clutch and means for moving the movable jaw from a first nonsealing position to a second sealing position in sealing cooperation with said stationary jaw including a second single-revolution clutch, wherein the moving means includes a 2-to-1 speed reducer coupling the first single-revolution clutch and the transferring member and a 2-to-1 speed reducer coupling the second single-revolution clutch and the jaw, and separate means for actuating said first and second clutches so that one actuation of the first single-revolution clutch moves the transferring member from its first position to its second position and another actuation of the first single-revolution clutch moves the transferring member from its second position to its first position and so that one actuation of the second single-revolution clutch moves the movable jaw from its first position to its second position and another acutation of the second single-revolution clutch moves the movable jaw from its second position to its first position.

4,617,785

PACKAGING APPARATUS

Hajime Chikatani, Hachioji, and Sanji Kawakami, Kodaira, both of Japan, assignors to Kabushiki Kaisha Daisei Kikai, Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,307
Claims priority, application Japan, May 23, 1981, 56-78307
Int. Cl.[4] B65B *43/04, 43/34*
U.S. Cl. 53—562 **8 Claims**



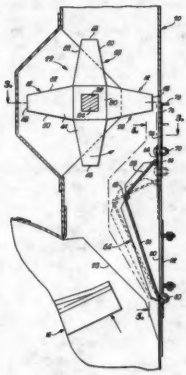
1. A packaging apparatus comprising:
means for positioning sheet materials next to one another to form at least two facing sheets;
means for bonding portions of said at least two facing sheets;
means for cutting said bonded sheets to form bags;
bag opening means comprising bag opening members, at least one of said bag opening members being mounted for movement between said at least two facing sheets prior to said bonding step;
means associated with said bag opening members for further separating said at least two facing sheets and fully opening said bags after said bonding step; and
movable endless chains for movably supporting each of said bag opening members for movement between said at least two facing sheets prior to said bonding step.

4,617,786

FORAGE HARVESTER HAVING SUPPLEMENTAL CROP DISINTEGRATING MEANS

Ferol S. Fell, Newton, and Howard J. Ratzlaff, Hesston, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Aug. 15, 1984, Ser. No. 641,049
Int. Cl.[4] A01D *45/02*
U.S. Cl. 56—13.4 **5 Claims**



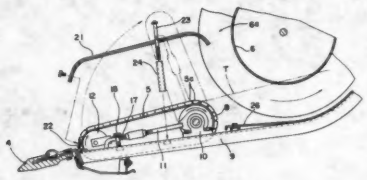
1. In an implement for harvesting forage of the kind having kernels, the combination of:
means for cutting the standing forage;
means for chopping the cut forage;
an enlongated, generally upright chute disposed to receive the chopped forage at the lower end of the chute for continuous projection of the forage in a stream with substantial velocity along the chute and discharge at the upper end of the latter;
a rotor in said chute for cracking said kernels as the chopped forage is projected through the chute,
said rotor including:
an elongated shaft,
means supporting the shaft for rotation about its longitudinal axis, and
a plurality of cracking elements carried by the shaft for rotation therewith,
said elements being spaced apart along the shaft,
each element having a number of elongated plates spaced circumferentially of the rotor and extending radially outwardly from the shaft,
each plate having a pair of opposed, flat faces, and a relatively thin, kernel-engaging, leading edge with respect to the overall length of the rotor,
each plate terminating in an elongated outer end remote from the shaft; and
means for spinning said rotor at a speed substantially in excess of the velocity of the stream prior to reaching the rotor,
said chute being provided with deflecting means therein between said lower end of the chute and the rotor, said deflecting means being movable to and from a position diverting the stream laterally of the chute.

4,617,787

COMBINE HARVESTER MACHINE

Jutaro Eguchi; Tetsuichi Odahara, and Junzo Sukenari, all of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Continuation of Ser. No. 547,823, Nov. 2, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 785,022
Claims priority, application Japan, Sep. 9, 1983, 58-167240
Int. Cl.[4] A01D *41/12*
U.S. Cl. 56—14.6 3 Claims



1. A combine harvester machine, comprising

a machine body having harvester frames and side plates,

a reel connected to the machine body for raking grain stalks toward the machine body,

cutting means connected to the harvester frames and located under the reel, said cutting means cutting grain stalks raked by said reel,

a drum having augers at an outer periphery thereof and rotationally connected to the machine body to transfer grain stalks rearwardly of the machine body,

front conveyor means connected to the harvester frames between the cutting means and the drum to transfer the grain stalks cut by the cutting means to the drum, said front conveyor means including a plurality of conveyors arranged side by side between the side plates of the machine body, each conveyor including:

a rear rotary member rotationally connected to the frames and adapted to be rotated by power means,

rod-shaped members each having front and rear ends and a turnbuckle between the front and rear ends so that the length of the rod-shaped member is adjusted by the turnbuckle, each rod-shaped member being pivotally connected to side of the rear rotary member at the rear end thereof,

a front rotary member rotationally connected to the front ends of the rod-shaped members, and

a conveyor belt situated between the front and rear rotary members, an imaginary surface extending through an upper surface of the conveyor belt, when the conveyor is operated for transfer of the grain stalks, passing substantially adjacent to a lower periphery of the drum to smoothly transfer the grain stalks to the drum, each conveyor being independently pivotable relative to the rear rotary member to facilitate maintenance of each conveyor,

covers situated along upper side portions of the conveyor belts to completely cover spaces between the conveyor belt and adjacent structure, each cover including a first bolt for connecting a front portion of the cover to the frame, a second bolt with a head, said second bolt passing through a rear portion of the cover and connected to the frame, and a cylindrical member situated around the second bolt so that the cover is securely retained between an upper portion of the cylindrical member and the head of the second bolt, and

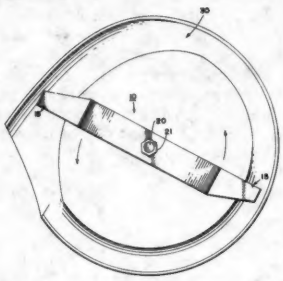
stop members and third bolts, said third bolt passing through the stop member and being detachably connected to the frame so that the stop member engages the rod-shaped member to prevent the rod-shaped member from swinging upwardly when the machine is operated, and each conveyor is independently turned upwardly relative to the rear rotary member for maintenance thereof when the stop member is removed from the frame by detaching the third bolt.

4,617,788

LAWN MOWER LEAF MULCHING BLADE AND METHOD

Verne D. Sebastian, 4908 Kingswood Dr., Greensboro, N.C. 27410

Filed May 22, 1985, Ser. No. 736,669
Int. Cl.[4] A01D *55/18*
U.S. Cl. 56—295 6 Claims



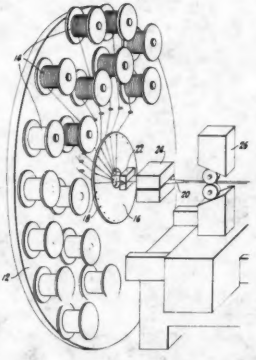
1. A lawn mower blade for a rotary lawn mower comprising: a unitary longitudinal member, said member having a pair of cutting edges thereon, said cutting edges on opposite sides of said longitudinal member, said longitudinal member defining a mounting aperture, said aperture positioned between said cutting edges, each of said cutting edges having a notch consisting of one v-shaped notch, said notch defining a space shaped substantially as an equilateral triangle, and said notches positioned approximately $\frac{1}{2}$ inch from each tip of said longitudinal member.

4,617,789

APPARATUS AND METHOD FOR FABRICATING MULTI-STRAND SUPERCONDUCTING CABLE

Albert R. Borden, El Cerrito, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 1, 1985, Ser. No. 718,397
Int. Cl.[4] D02G *3/36;* D07B *1/06;* H01L *39/24*
U.S. Cl. 57—6 14 Claims



1. A method of fabricating a multi-strand cable comprising the steps of:

providing a tapered mandrel which is elongate along a direc-

tion transverse to the direction of taper and has a hollow core with a longitudinal wedge-shaped channel extending therethrough.

winding a plurality of wire strands around said mandrel diagonally with respect to said transverse direction,

inserting wedge-shaped pieces, articulately coupled together in spaced relationship by a superconducting ribbon means, sequentially through said channel of said mandrel, and

drawing said wedge-shaped pieces and said plurality of wire strands to form a cable having said wedge-shaped pieces located within said wire strands when said wire strands are drawn from said tapered mandrel.

4,617,790

PROCESS AND APPARATUS FOR PIECING A YARN AT A SPINNING UNIT OF AN OPEN-END FRICTION SPINNING MACHINE

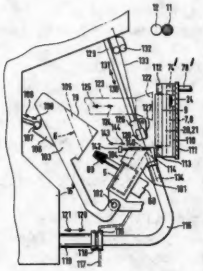
Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of Bad Überkingen, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 675,009

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342472

Int. Cl.[4] D01H *15/00, 7/892*

U.S. Cl. 57—263 **44 Claims**



1. A process for piecing yarn on an open-end friction spinning machine of the type having at least one spinning unit with:

a pair of friction rollers arranged adjacent one another to form a wedge-shaped yarn forming gap,

friction roller driving means for driving the friction rollers in the same rotational direction during spinning operations,

fiber opening means for separation fibers to be supplied to the yarn forming gap, said fiber opening means including a rotatably drivable opening roller means,

sliver feeding means for feeding sliver to the fiber opening means, said sliver feeding means including a drivable sliver feeding roller means,

primary suction means for applying suction forces to the yarn forming gap,

and yarn winding means for winding the spun yarn on a spool, said process comprising:

returning a yarn end to the yarn forming gap to form a yarn piecing with, fibers supplied to the yarn-forming gap,

feeding sliver to the opening means,

removing from the spinning unit fibers opened up during feeding of the sliver preceding the actual piecing process,

feeding fibers to the yarn-forming gap to form a yarn piecing with the yarn end,

and withdrawing the yarn end with the yarn piecing connected therewith,

whereby a predetermined constant supply of fibers are fed to the yarn forming gap for the piecing process by supplying a predetermined constant characteristic sliver end to the opening roller means for each piecing process.

4,617,791

APPARATUS FOR MONITORING AND RESTARTING THE CUT YARN DURING THE REPLACEMENT OF FULL BOBBINS ON THE SPINDLES OF A CONTINUOUS SPINNING MACHINE

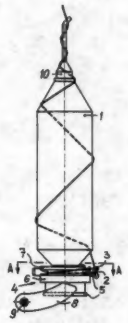
Pierre Lousberg, Stembert, Belgium, assignor to Societe Anonyme des Ateliers Houget Duesberg Bosson, Belgium

Filed Oct. 4, 1984, Ser. No. 657,629

Claims priority, application Belgium, Oct. 5, 1983, 211650

Int. Cl.[4] D01H *1/38, 1/40*

U.S. Cl. 57—299 **5 Claims**



1. In a continous spinning machine, an apparatus for monitoring and restarting a cut yarn when a full bobbin is replaced by an empty tube comprising an underwinding device for winding the last yarn turns on the full bobbin and around said device with the aid of a traveller, said underwinding device comprising an inner ring and an outer ring, the outer ring being slidable on the inner ring, each ring being provided with at least one knife blade, said blades being arranged vertically in such manner whereby upon sliding of said outer ring upon said inner ring said blades can bome into contact with said last yarn wound around said underwinding device and cut them, and means for positively retaining the yarn end origniating from the traveller to allow starting of the next winding operation.

4,617,792

AIR FLOW CONTROL ARRANGEMENT FOR AN OPEN-END FRICTION SPINNING MACHINE

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Dec. 3, 1984, Ser. No. 677,367

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1983, 3343762

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

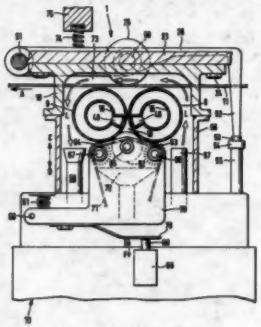
Int. Cl.[4] D01H *7/885, 11/00*

U.S. Cl. 57—401 **23 Claims**

1. An open-end friction spinning machine having at least one spinning unit containing:

two friction rollers that are arranged next to one another to form a wedge-shaped yarn forming gap serving as a yarn forming zone,

a housing side means disposed adjacent the friction rollers at the side thereof opposite the yarn-forming gap,



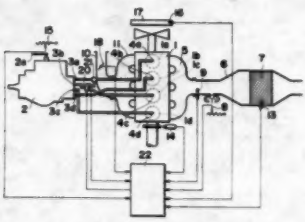
and periodically switchable means for producing an air flow between the housing side means and the friction rollers.

4,617,793

EXHAUST-GAS PARTICLE TREATING DEVICE FOR INTERNAL COMBUSTION ENGINE

Shoichi Suzuki, and Keiichi Yamada, both of Higashi-Matsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1984, Ser. No. 578,759
Claims priority, application Japan, Feb. 23, 1983, 58-25585[U]
Int. Cl.[4] F01N *3/02*
U.S. Cl. 60—285 4 Claims



1. An exhaust gas particle treating device for an internal combustion engine having fuel injection nozzles and fuel supply pipes connected thereto, and an exhaust gas system having a filter for collection of exhaust gas particles therein, which filter is to be regenerated by burning the exhaust gas particles collected on the filter, said device comprising:

a changeover valve which connects at least two of the fuel supply pipes and having means for adjusting the flowrate of fuel from one of said injection pipes to the other;

means for detecting engine conditions indicating the necessity for regenerating the filter;

a control circuit means connected to said engine condition detecting means and to said changeover valve for moving said changeover valve in response to detection of engine conditions indicating the necessity for regenerating the filter; and

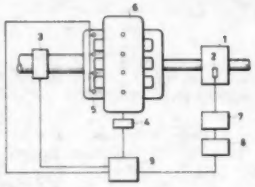
means for detecting the amount of displacement of said changeover valve connected to said control circuit means for causing said control circuit means to stop moving said changeover valve when a position thereof is reached for causing the desired amount of flow through said changeover valve.

4,617,794

EXHAUST GAS PURIFYING METHOD AND APPARATUS FOR INTERNAL COMBUSTION ENGINES

Yoshiyasu Fujitani; Hideaki Muraki; Koji Yokota, all of Nagoya; Hideo Sobukawa, and Shinichi Matsunaga, both of Aichi, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Jun. 3, 1985, Ser. No. 740,427
Claims priority, application Japan, Jun. 6, 1984, 59-116102
Int. Cl.[4] F01N *3/20*
U.S. Cl. 60—274 14 Claims



1. An exhaust gas purifying method for an internal combustion engine comprising:

detecting the temperature of an exhaust gas purifying catalyst disposed in an exhaust system of said internal combustion engine by a temperature sensor;

converting a signal from said temperature sensor to a first electric signal by a signal converter;

oscillating a second electric signal having a frequency and an amplitude and a predetermined frequency and amplitude range, said predetermined frequency and amplitude range being predetermined based upon the kind of said catalyst used, the frequency and amplitude of said second signal being adjusted within said predetermined range by an oscillator in accordance with said first electric signal from said signal converter; and

varying an actual air-fuel ratio toward the higher air-fuel ratio side and the lower air-fuel ratio side with respect to the theoretical air-fuel ratio, based on said second electric signal from said oscillator.

4,617,795

EXHAUST GAS PIPE FOR INTERNAL-COMBUSTION ENGINES HAVING A RECEIVING OPENING FOR A HEATED PROBE FOR DETERMINING THE OXYGEN CONTENT OF THE EXHAUST GASES

Jörg Abthoff, Pluederhausen; Hans-Dieter Schuster, Schorndorf; Gunter Loose, Remseck, and Günther Ebinger, Heiningen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 13, 1985, Ser. No. 711,253
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1984, 3409045
Int. Cl.[4] G01N *27/26*
U.S. Cl. 60—276 7 Claims

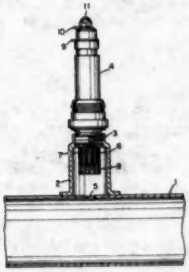
1. A system for measuring the amount of oxygen in exhaust gas emitted by an internal combustion engine and flowing through an exhaust pipe, the system comprising:

sidewall aperture means in said exhaust pipe for accommodating a portion of exhaust gas to be monitored;

sensing probe housing means including housing wall means defining a probe accommodating chamber bounded by inner surfaces of said housing wall means, said sensing probe housing means being located entirely outside of said exhaust pipe such that only said inner surfaces of said housing wall means are impinged by any exhaust gas, said exhaust gas impinging on said inner surfaces being said portion of exhaust gas to be monitored, with outer surfaces of said sensor probe housing means being free of impingement by any exhaust gas; and

probe means for determining the oxygen content of engine

exhaust gases, with at least a portion of said probe means positioned in said probe accommodating chamber which senses the oxygen content in said portion of exhaust gas,



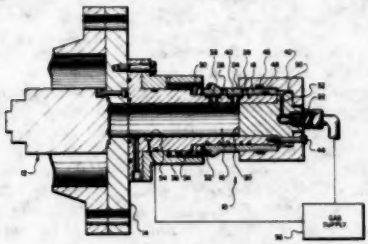
said probe means being free of any impingement by any exhaust gas except by said portion to be monitored disposed in said probe accommodating chamber.

4,617,796

SLEEVE VALVE FOR A PULSED GAS GENERATOR

Janet S. Knapp, Simi Valley, Calif., and Jerry L. Hillman, Langlois, Oreg., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 18, 1985, Ser. No. 713,209
Int. Cl.[4] F02K 7/06
U.S. Cl. 60—39.79 **6 Claims**



1. In combination with a rocket-engine gas generator in an aqueous environment,

a sleeve valve formed with a chamber wall and an end plug which define an internal chamber, the chamber being coupled to receive the output of the gas generator, the chamber wall having at least one port therethrough, a movable sleeve fitting around the outside of said chamber wall and having at least one port therethrough, and a force/balance bias means for maintaining the position of the sleeve so that its port is not axially aligned with the chamber-wall port whereby the latter is closed prior to the valve being activated;

pressure sensor means in the internal chamber for sensing the gas pressure therein; and

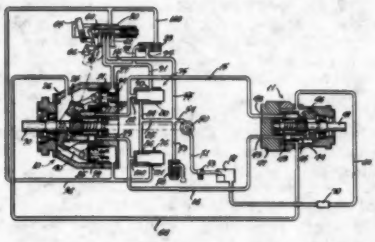
gas source means coupled to receive the output signal of the pressure sensor and to supply pressurized gas to the sleeve valve to move the sleeve axially against the force of the bias means so that the sleeve port aligns with the chamber-wall port to allow rapid discharge of the gas within the internal chamber when the internal chamber pressure and volume reaches a predetermined level.

4,617,797

MULTI-FUNCTION VALVE

Keith R. Williams, Nevada, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 9, 1984, Ser. No. 610,085
Int. Cl.[4] F16D 31/02
U.S. Cl. 60—444 **15 Claims**



1. A hydrostatic transmission having a pair of hydraulic displacement units connected in a closed loop circuit and with one of the units having variable displacement comprising, pressure limiter means including a pressure limiter valve member and reponsive to a predetermined pressure in the closed loop circuit for reducing the displacement of the variable displacement unit, means including a relief valve member providing high pressure relief for said closed loop circuit at a pressure in said closed loop circuit which exceeds said predetermined pressure, said valve members being structurally related to required operation of said pressure limiter valve member before said relief valve member can operate, a calve body mounting said valve members and having an inlet port connected to said closed loop circuit and a pair of outlet ports, said pressure limiter valve member functioning as a pilot valve for said relief valve member and having a closed position against pressure at the inlet port to block the inlet port from one of the outlet ports, said relief valve member having a closed position against pressure at the inlet port to block the inlet port from the other of said outlet ports, a first heavy spring urging the pressure limiter valve closed, a second light spring urging the relief valve member closed, passage means exposing the pressure limiter valve member to the pressure at the inlet port whereby said predeterminded pressure overcomes the force of the first heavy spring to open the pressure limiter valve member and including an orifice to establish a flow-induced pressure differential across the relief valve member when the pressure limiter valve member opens whereby said relief valve member opens when the flow-induced pressure differential exceeds the force of said second light spring, and means to neutralized the pressure limiter valve member whereby said flow-induced pressure differential can operate said relief valve member without said predetermined pressure existing in said closed circuit.

4,617,798

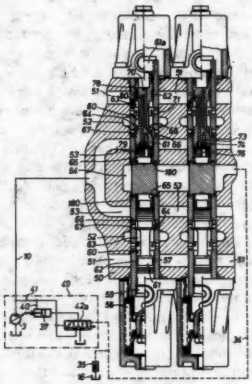
HYDROSTATIC DRIVE SYSTEMS

Alfred Krusche, Johannesberg, and Walter Kropp, Sulzbach am Main, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 3, 1984, Ser. No. 596,293
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1983, 3313450
Int. Cl.[4] F16D 31/02
U.S. Cl. 60;450 **8 Claims**

1. In a hydrostatic drive system having an adjustable pump, an adjusting element on said pump, a pump servo piston connected to and capable of moving said adjusting element, said servo piston being movable in a cylinder, a main feed line from said pump, a plurality of consumers of pressure fluid, a branch feed line connecting each said consumer to said main feed line, a return line from each consumer to a reservoir, a switching

means in each branch line, a pair of adjustable parallel connected restrictors in each branch line, an adjusting element in each of said parallel connected restrictors loaded on one side with the pressure in said branch feed line and on the other with a control pressure and a spring, the control pressure being identical on all parallel connected restrictors, a separate branch control line delivering said control pressure to each parallel connected restrictor from a common control pressure line, check valve means opening toward the common control line in each branch control pressure line, an adjustable measuring restrictor in each branch line leading to a consumer and a control pressure line connected to said branch line between said adjustable measuring restrictor and the consumer, the improvement comprising said switching means including a valve housing having a plurality of longitudinal bores corresponding to the number of consumers, a main spool movable in each said bore, said main spool being hollow at each end, an inlet port in said housing connected to the main feed line and to each bore, an outlet connected to said control pressure means and each bore adjacent the inlet connection with the bore, secondary valve spools in each of the hollow ends of said main spool, spring means acting on each spool to urge the spools towards the ends of said main spool, and a plurality of radial passages spaced lengthwise on the main spool communicating with said hollow ends and forming with the secondary



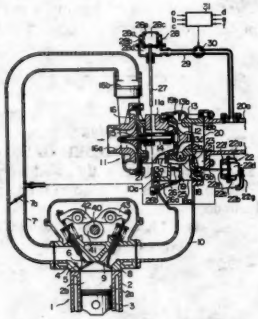
spools said parallel connected restrictors, an inlet chamber in the housing communicating with said bore intermediate its ends and communicating between said bore and the feed line, an exhaust chamber at each end of the housing communicating with the bore and said reservoir, a work chamber at each end of the housing intermediate the inlet and exhaust chambers and connected to the consumers of pressure fluid, a spring means in each of said hollow ends acting on said secondary spools to urge them towards the two ends of said spool, the plurality of spaced radial passages in said main spool communicating with said hollow ends, said radial passages being spaced so that in a working postion they communicate between and variably restrict flow between the work chambers and one of the inlet chambers in one position and the exhaust chambers in a second position, and wherein in each work position the radial passages in the main spool and the sensing grooves and passages in the secondary spools are arranged so that when the main spool is moved to connect the inlet chamber with a work chamber the end of the secondary piston on the end through which such connection is made opposite the spring is connected with a radial passage acting as a measuring restrictor and the end of the secondary spool loaded by the spring is connected through a radial passage in the main spool through a sensing passage in the secondary spool and the other secondary spool on the end of the main spool connecting the opposite work chamber and the exhaust chamber, the spring end of the secondary spool connects the opposite work chamber through the sensing groove at that end and a sensing passage with the end of the secondary spool opposite the spring to move the secondary spool against the spring to connect the work chamber and exhaust chamber, and wherein the side of the secondary spool loaded with the pressure spring can also be connected through a check valve with the work chamber connected with the consumer.

4,617,799

PLURAL TURBINE INLET PASSAGE TURBO-SUPERCHARGER WITH INLET PASSAGE SHUT-OFF VALVE

Tomoo Todokoro; Haruo Okimoto, and Ikuo Matsuda, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Dec. 14, 1984, Ser. No. 681,829
Claims priority, application Japan, Dec. 16, 1983, 58-238398
Int. Cl.[4] F02B *37/12*; F01D *17/14, 17/18*
U.S. Cl. 60—602 **9 Claims**



1. A turbo-supercharger for an engine comprising a supercharging compressor located in an intake system of the engine and a turbine located in an exhaust system of the engine, said turbine including a turbine casing having a substantially planar surface which is connected with an exhaust passage of the engine and a turbine rotor rotatably mounted in said turbine casing and connected with the compressor, said turbine casing including exhaust gas inlet passage means for directing exhaust gas flow from the exhaust passage to the turbine rotor, said inlet passage means including mutually separated parallel first and second inlet passages, said first and second inlet passages being opened to said exhaust passage respectively through first and second inlet ports formed in said mating surface and surrounded by said exhaust passage, a shut-off valve provided in said exhaust passage and having a valve member adapted to be seated on said planar surface around said second inlet port to totally close the second inlet port.

4,617,800

APPARATUS FOR PRODUCING POWER USING CONCENTRATED BRINE

Gad Assaf, Rehovot, Israel, assignor to Geophysical Engineering Company, Seattle, Wash.

Filed Apr. 4, 1985, Ser. No. 719,870
Int. Cl.[4] F01K *19/10*
U.S. Cl. 60—689 **16 Claims**

1. A power generating plant comprising:

(a) a source of liquid working fluid;

(b) a heat exchanger having an evaporator side for converting liquid working fluid from said source into vaporized working fluid;

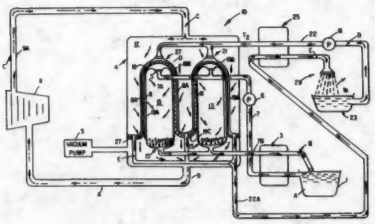
(c) turbine means responsive to said vaporized working fluid

for producing work and heat depleted vaporized working fluid;

(d) said heat exchanger having a condenser side for receiving said heat depleted working fluid;

(e) a source of concentrated brine;

(f) means to exchange brine between the brine source and



said condenser side for contacting brine with said heat depleted vaporized working fluid thereby condensing the latter and heating and diluting the contacted brine;

(g) means for effecting the transfer of heat in said contacted brine in said condenser side to liquid working fluid in said evaporator side; and

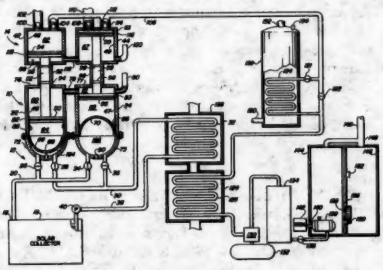
(h) means for concentrating exchanged brine.

4,617,801

THERMALLY POWERED ENGINE

Robert W. Clark, Jr., 2232 W. Joan de Arc Ave., Phoenix, Ariz. 85029

Filed Dec. 2, 1985, Ser. No. 803,549
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—116 **20 Claims**



14. An engine comprising:

a plurality of pairs of power cylinders, each power cylinder defining a closed interior space, and each cylinder having a first and a second end;

a piston reciprocally mounted within the interior space of each power cylinder of each pair of power cylinder and dividing the enclosed space within each power cylinder into two portions, a first portion and a second portion;

a piston rod connected to the piston of each power cylinder and projecting through the first end of each power cylinder;

a flexible diaphragm mounted in the second portion of each power cylinder the space enclosed between the flexible diaphragm and the second end of each power cylinder defining a power chamber having a maximum and a minimum volume;

a fluid substantially filling the first portions of each pair of power cylinders;

means interconnecting the first portions of each pair of power cylinder so that said fluid can flow between the two first portions of each of said power cylinders;

a given volume of said fluid being positioned in the second portion of each power cylinder between the piston and the flexible diaphragm;

a heat transfer loop including a working fluid, an evaporator, a heat sink, and the power chambers of each of the pairs of power cylinders, and valve means for regulating the flow of working fluid through the power chambers of each of the pairs pairs of power cylinders;

control means for controlling the valve means so that the motion of the pistons of each pair of powered cylinder is substantially 180° out of phase with the other piston of the pair;

means for causing the working fliud flowing out of the power chambers of a first pair of power cylinders to flow into the power chambers of a next succeeding pair of power cylinders, said working fluid flowing through the pairs of power cylinders serially with the working fluid from the last pair of power cylinders flowing into the condenser of the heat transfer loop; and

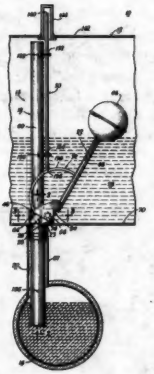
means for converting motion of the piston rods of the pairs of power cylinders to useful work.

4,617,802

FREEZER APPARATUS

Armin Fiedler, Chicago, Ill., assignor to International Freezer Corporation, Chicago, Ill.

Filed Apr. 18, 1985, Ser. No. 724,659
Int. Cl.[4] A23G *9/20*
U.S. Cl. 62—125 **46 Claims**



1. Freezer apparatus for dispensing ice cream or other food ice materials comprising a food mix container supported above a freezer chamber for retaining a level of food mix; a freezer chamber operable to dispense frozen or partially frozen food materials to a consumer; channel means for providing a fluid connection between the food mix container and the freezer chamber, said channel means having an open lower end extending below a level of food mix in the freezer chamber and including a planar exterior surface surrounding a food mix inlet port portion from the planar surface extending to within the channel and defined by walls of the planar surface, said inlet port disposed within a lower portion of the food mix container for admitting a predetermined constant flow rate of food mix from said food mix container through said port and into the freezer chamber, said channel means including an open upper end extending above a level of food mix in the food mix container for receiving air from above the food mix and directing said air, together with said food mix flowing through said port, into the freezer chamber, said air and food mix flowing into the freezer chamber automatically, in replacement amounts, when food mix is dispensed to said consumer from the freezer chamber, as a result of pressure balancing between the food mix container and the freezer chamber; a float means disposed

within the food mix container including a buoyant float member adapted to extend above an upper surface of the food mix within the food mix container and an integral elongated float arm extending downwardly from the float member within the food mix toward a floor of the food mix container; a port-sealing plate having a planar port-sealing surface connected to the float arm and pivotally mounted in sealing engagement with the food mix inlet port such that a change in level of food mix in the food mix container causes the port-sealing plate to pivot with respect to the port as an included angle between the elongated float arm and the floor of the food mix container changes with the change in food mix level thereby changing a port area sealed by said port-sealing plate to maintain a constant flow of food mix into said freezer chamber as the food mix level changes in the food mix container, said channel means including two sealingly interconnectable channel portions comprising an upper mixing conduit disposed within the food mix container and a freezer chamber feed conduit having an upper enlarged portion disposed within the food mix container for interconnection to the mixing conduit, and an integral freezer feed conduit extending downwardly from the enlarged portion to form a continuous conduit from said mixing conduit to said freezer chamber.

4,617,803

TEMPERATURE RESPONSIVE CONTROL UNITS

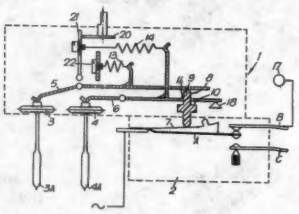
Guglielmo Rossi, Linkenheim/Hochstetten, Fed. Rep. of Germany, assignor to Ranco Incorporated, Dublin, Ohio

Filed Oct. 5, 1983, Ser. No. 539,123

Claims priority, application United Kingdom, Feb. 5, 1982, 8203376; Apr. 23, 1982, 8211801

Int. Cl.[4] F25B *41/00*

U.S. Cl. 62—209 **11 Claims**



1. A temperature responsive control unit comprising a first temperature sensing element comprising a bellows system responsive to the temperature of heating or cooling means and a second temperature sensing element comprising a bellows system responsive to an ambient temperature which results from the action of the heating or cooling means a common switch device which is operable in one sense by the first temperature sensing element and in the opposite sense by the second temperature sensing element, said bellows system cooperating with respective operating levers characterised in that the operating lever of the first temperature sensing element acts on an operating element of the switch device through a displaceable member which has a shoulder against which the operating lever of the second temperature sensing element acts, the movement of the latter operating lever in engagement with said shoulder being limited by a stop which effectively prevents operation of the switch in the said one sense by the second temperature sensing element.

4,617,804

REFRIGERANT FLOW CONTROL DEVICE

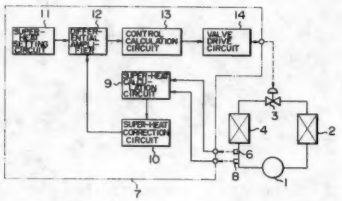
Toshihiko Fukushima, Ibaraki; Seigo Miyamoto, Katsuta; Kosaku Sayo, Katsuta, and Kenji Emi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 23, 1986, Ser. No. 824,552

Claims priority, application Japan, Jan. 30, 1985, 60-14183

Int. Cl.[4] F25B *41/00*

U.S. Cl. 62—212 **6 Claims**



1. A refrigerant flow control device for used with a refrigerator cycle comprising a compressor, a condenser for condensing refrigerant, an evaporator for evaporating the refrigerant and an expansion valve, the opening of which can be electrically adjusted for controlling the flow rate of the refrigerant, said control device comprising:

means for detecting the super-heat degree of the refrigerant at an outlet of the evaporator;

a control circuit for producing a control signal representing a difference between said detected super-heat degree and a preset super-heat degree, and including means for correcting said detected super-heat degree before producing said control signal, when said detected super-heat degree is zero, to a corrected super-heat degree having a negative value, so that said control signal represents a difference between the negative super-heat degree and the preset super-heat degree; and

valve driving means connected to receive said control signal for controlling the opening of said expansion valve so as to maintain the super-heat degree of the refrigerant at the outlet of said evaporator at said preset super-heat degree.

4,617,805

AIR CONDITIONER SYSTEM FOR BUILDING

Akio Ikemura, Kurobe, and Minoru Kajiki, Toyama, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 24, 1985, Ser. No. 790,948

Claims priority, application Japan, Nov. 13, 1984, 59-172041[U]

Int. Cl.[4] F25D *23/12*

U.S. Cl. 62—259.1 **8 Claims**

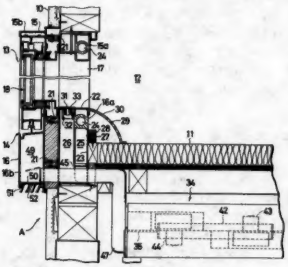
1. An air conditioner system in a building having a wall and a floor defining surfaces of a house interior space, comprising:

(a) a heat exchanger unit disposed below the floor and having a heat exchange element disposed therein, a room air intake chamber, a room air discharge chamber communicating with said room air intake chamber through said heat exchange element, a fresh air intake chamber and a fresh air discharge chamber communicating with said fresh air intake chamber through said heat exchange element;

(b) a window disposed in the wall and including a rectangular window frame assembly having a substantially hollow sill, said sill having an internal conduit for the passage of a heat transferring medium and a pair of juxtaposed internal air passages extending along said conduit, and further having a side wall and a top wall both facing the house interior space, said side wall having at least one air inlet for communicating between one of said air passages and the house interior space, said top wall having at least one

air outlet for communicating between the other air passage and the house interior space; and

(c) a first duct communicating through said one air passage with said room air intake chamber, a second duct communicating through said other air passage with said fresh air discharge chamber, a third duct communicating through said room air discharge chamber with the outside air, and a fourth duct communicating through said fresh air intake chamber with the outside air.



4,617,806

LIQUID LEVEL CONTROL APPARATUS

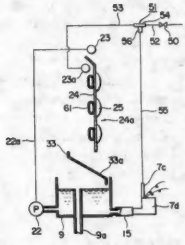
Tadashi Sakai, and Nobutaka Naruse, both of Toyoake, Japan, assignors to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Aug. 26, 1985, Ser. No. 769,332

Claims priority, application Japan, Sep. 5, 1984, 59-184517; Sep. 5, 1984, 59-184518; Jun. 20, 1985, 60-132932

Int. Cl.[4] F25C *1/12*; F16K *31/18*

U.S. Cl. 62—347 **6 Claims**



1. A liquid level control apparatus, comprising:

a tank for holding liquid;

a hollow case in fluid communication with said tank, said hollow case having an opening at a lower end thereof, and a chamber for trapping air, said chamber being in fluid communication with said opening;

a float disposed in said hollow case and guided for vertical movement in response to changing liquid levels in said tank;

guide means disposed in said chamber for guiding said float in said vertical direction;

connection means between said tank and said hollow case for flow of liquid therebetween;

an upstanding tubular member having a lower end in fluid communication with said chamber, said lower end being at a position higher than the uppermost point of said connection means, thus defining a level of liquid within said hollow case at which said chamber is hermetically sealed and thereby preventing said guide means from being immersed in said liquid, irrespective of the level of said liquid in said tank or in said hollow case;

a liquid supply valve; and

a conduit connected between said upstanding tubular member and said liquid supply valve to supply liquid to said hollow case and cause liquid to flow from said hollow case towards said tank to thereby prevent accumulation of impurities in said hollow case.

4,617,807

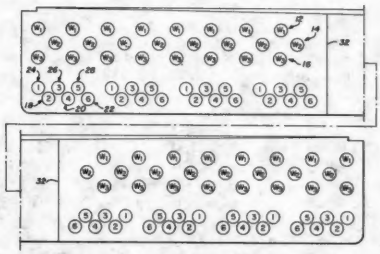
INVOLUTE COIL COLD PLATE

James D. Pritchett, Plano, and James D. Cutbush, San Antonio, both of Tex., assignors to Booth, Inc., Dallas, Tex.

Filed Jul. 8, 1985, Ser. No. 752,556

Int. Cl.[4] B67D *5/62*

U.S. Cl. 62—399 **10 Claims**



1. A cold plate for cooling liquids, comprising:

a plurality of involute coils formed of tubing, the tubing of each coil having an inlet and an outlet for permitting a liquid to flow through the tubing, each of said involute coils lying in a horizontal plane with the involute coils being stacked vertically with a space between each adjacent coil; and

a thermally conductive material encasing the coils for conducting thermal energy from the liquid in the coils to cool the liquid, the thermally conductive material having an upper surface being generally horizontal for contact with ice to cool the liquids within the involute coils, the involute coils providing for relatively uniform heat transfer through the thermally conductive material.

4,617,808

OIL SEPARATION SYSTEM USING SUPERHEAT

Thomas C. Edwards, 1426 Gleneagles Way, Rockledge, Fla. 32955

Filed Dec. 13, 1985, Ser. No. 808,650

Int. Cl.[4] F25B *43/02*

U.S. Cl. 62—472 **5 Claims**

1. A combination superheater and oil separator for a refrigeration system having a source of heated medium and a source of non-superheated refrigerant gas-oil mixture comprising:

a sealed casing;

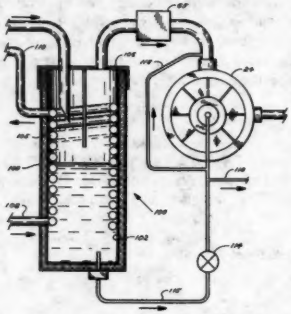
a heat transfer unit within said casing having a heat transfer surface;

means on said casing for connecting the interior of said casing to receive said mixture from said source thereof;

means for connecting said heat source to supply heated medium at a temperature and heat transfer rate through said heat transfer surface to boil-off refrigerant gas from said mixture and produce superheated refrigerant gas;

means on said casing for connecting the interior of said casing to deliver superheated refrigerant gas boiled off from said mixture in the interior of said casing;

means on said casing below a predetermined level for connecting the interior of said casing to deliver oil remaining



from the boil-off of super-heated refrigerant vapor from said mixture.

4,617,809

FLOW PRESS, ESPECIALLY FLOW SAMMYING MACHINE, FOR THE PRODUCTION AND PROCESSING OF LEATHER

Flekac Frantisek, Graf-Staufenberg-Ring 102, D-6380 Bad Homburg vor der Höhe, Fed. Rep. of Germany

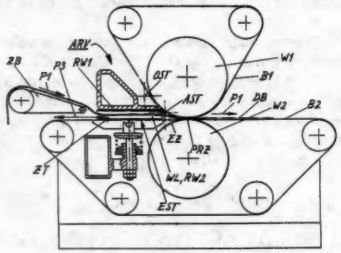
PCT No. PCT/DE82/00212, § 371 Date Jul. 13, 1983, § 102(e) Date Jul. 13, 1983, PCT Pub. No. WO83/01786, PCT Pub. Date May 26, 1983

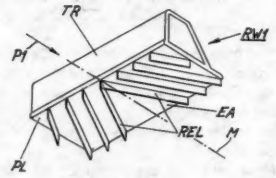
PCT Filed Nov. 15, 1982, Ser. No. 517,519

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1981, 3145359

Int. Cl.[4] C14B *1/08, 1/04*

U.S. Cl. 69—44 **8 Claims**





1. Apparatus for treating leather, comprising at least one opposed pair of rolls between which the leather to be treated is guided, means for moving the leather along a flow path from a location spaced apart from said rolls to said rolls, stretching means for stretching the leather prior to its being guided between said rolls and comprising a first stretching tool disposed on one surface side of the leather and operable to stretchably engage the leather at a location in the entrance wedge of said rolls at a distance from said rolls whereby the stretched leather does not contract prior to entering between said rolls, and a feed table for feeding the leather to the rolls, said feed table being movable between a first preparation and arranging position spaced apart from said rolls in a direction opposite the flow path of the leather and a second entrance position in the entrance wedge of said rolls, said feed table having support means for said first stretching tool and disposed on the opposite surface side of the leather from said first stretching tool.

4,617,810

SLIDING GLASS DOOR LOCK

Aaron M. Fish, Cote St. Luc; Adamo M. D'Intino, Riviere-des-Prairies; Frank G. Moessner, Pointe Claire, and Stanley S. Mazoff, Dollard-des-Ormeaux, all of Canada, assignors to Ilxo Unican Corp., Rocky Mount, N.C.

Filed Aug. 5, 1985, Ser. No. 762,553

Int. Cl.[4] E05B *73/00*

U.S. Cl. 70—14 **12 Claims**

1. A sliding door locking means comprising: a locking bar forming a hook for clamping the edge of a first door, a housing forming a cross passage receiving said bar, a locking mechanism including a key cylinder received in said housing, said key cylinder including a retainer for holding said key cylinder in said housing, said housing forming an abutment at the edge of the second door, said locking mechanism locking the end of said locking bar when said bar is received in said cross passage of /in/ said housing, said housing defining a wall normally adjacent to said first door when the doors are locked, means defining an access window in said wall, said housing defining an access passage between said window and said retainer for releasing and replacement of /a/ said key cylinder in said lock mechanism when said locking mechanism is unlocked, said bar covering said window when it is received in said cross passage and preventing access to said retainer.

4,617,811

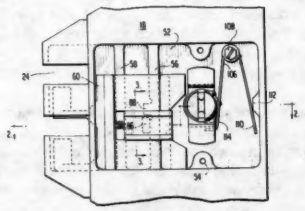
MECHANISM FOR OPERATING A DROP-BOLT DOOR LOCK

Stevie C. Roop, Dugspur, Va., assignor to Medeco Security Locks, Inc., Salem, Va.

Filed Aug. 3, 1984, Ser. No. 637,589

Int. Cl.[4] E05B *63/12*

U.S. Cl. 70—131 **5 Claims**



1. A high-security, defeat-resistant vertical drop-bolt lock

operating assembly, the assembly being of the type including a vertical drop-bolt member, an operating mechanism for operating the bolt member and a housing for the operating mechanism, the improvements comprising:

(a) guide rail means extending vertically within the housing,

(b) means on the bolt member cooperating with the guide rail means so that the bolt member is slidable vertically on the guide rail means,

(c) an actuator member carried by the bolt member and slidable vertically with the bolt, the actuator member also slidable transversely and horizontally within the bolt member,

(d) locking means cooperating between the actuator member and the guide rail means to stop vertical movement of the bolt member and the actuator member in either direction unless the actuator member is moved horizontally and transversely with regard to the movement of the bolt,

(e) cam means contacting the actuator member for moving the actuator member horizontally transversely of the bolt member movement and for sliding the bolt from locking to unlocking position and vice versa.

4,617,812

AUTOMOBILE DOOR LOCKING SYSTEMS

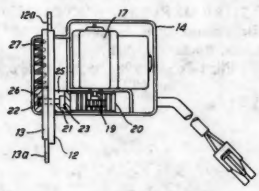
Peter G. Rogers, Redditch, England, assignor to Security & Auto Electrical Designs Ltd., Redditch, England

Filed Oct. 31, 1984, Ser. No. 666,745

Claims priority, application United Kingdom, Nov. 10, 1983, 8330006

Int. Cl.⁴ B60R *25/02*

U.S. Cl. 70—218 **9 Claims**



1. An automobile door locking system comprising mechanical means for connecting a door handle of a door to a door latch of the door, said mechanical means comprising separable parts, and electrically operated means for connecting said separable parts together, said electrically operated means including a locking member movable into engagement with said parts to cause them to move as a unit in a common direction whereby the latch can be released by operation of the door handle and movable out of engagement with said parts whereupon said parts are disconnected from each other whereupon the latch can no longer be operated by actuation of the handle.

4,617,813

LOCK-PICKING TOOL AND METHOD OF USE THEREOF

Walter S. Christopher, Park Ridge; Robert T. Kriskovich, Roselle, and Robert L. Steinbach, Glendale Heights, all of Ill., assignors to Chicago Lock Co., Chicago, Ill.

Filed Jul. 29, 1982, Ser. No. 403,094

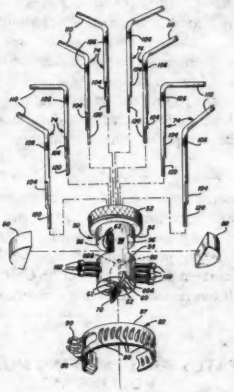
Int. Cl.⁴ E05B *19/20*

U.S. Cl. 70—394 **17 Claims**

1. In a lock-picking tool of the type having manually manipulable holder means, tumbler probes supported on said holder means and extending in the direction of a longitudinal axis of the holder means and being reciprocable in said direction, and setscrews threadedly engaging said holder means for clamping said tumbler probes to prevent such reciprocation relative to said holder means, the improvement which comprises:

means providing a diametral opening in a forward end of said holder means;

generally planar core means received within said diametral opening and projecting forwardly therefrom for transmitting torque from said holder means to the cylinder of a lock which is to be picked; and



means providing a plurality if longituidnal probe-receiving bores in said foward end and arranged in a planar transverse row with one side of each bore communicating with said diametral opening so that one side of the probe received in the bore extends into the diametral opening.

4,617,814

PROCESS FOR CONTROLLING LOAD DISTRIBUTION IN CONTINUOUS ROLLING MILL

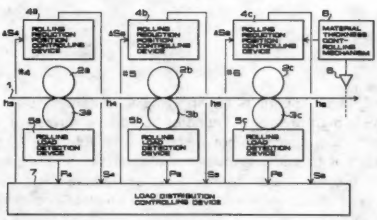
Yoshikazu Kotera, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1985, Ser. No. 734,113

Claims priority, application Japan, May 16, 1984, 59-99852

Int. Cl.⁴ B21B *37/12*

U.S. Cl. 72—8 **4 Claims**


ROLLING REDUCTION CONTROLLING DEVICE
MATERIAL THICKNESS MEASURING ROLLING MECHANISM
ROLLING LOAD DETECTION DEVICE
LOAD DISTRIBUTION CONTROLLING DEVICE

1. A process for controlling load distribution in a continuous rolling mill having a plurality of rolling stands rolling a material, comprising the steps of:

detecting an initial rolling load and an initial rolling reduction position of each rolling stand,

calculating a load distribution error when a ratio of detected loads of the most downstream rolling stand and the second most downstream rolling stand differ substantially from a predetermined ratio,

computing rolling reduction correction values for the most and second most downstream rolling stands in response to the calculation of a load distribution error such that the thickness of the material on the exit side of the most down-

stream rolling stand remains unchanged and such that the ratio of rolling loads of the most and second most downstream rolling stands is equal to the predetermined ratio when the rolling stands are corrected in accordance with the rolling reduction correction values,

said computing being performed using the calculated load distribution error together with (1) previously calculated correction coefficient values corresponding to similar mill operating conditions or (2) selected mill operating parameters when there is an absence of previously learned correction coefficient values corresponding to similar mill operating conditions,

correcting the rolling reduction positions of the most and the second most downstream rolling stands in accordance with the computed rolling reduction correctional values, and

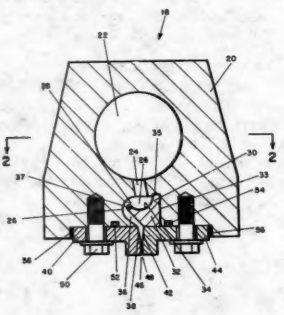
calculating correction coefficient values from the load distribution error and the amount of correction of the most downstream rolling stands when said computing is performed using the selected mill operating parameters so that said computing can be subsequently performed using the calculated position correction coefficient values when the mill has similar operating conditions.

4,617,815

APPARATUS FOR DESCALING HOT STRIP IN A ROLLING MILL

Joseph I. Greenberger, Pittsburgh, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Dec. 24, 1984, Ser. No. 685,817
Int. Cl.[4] B21B *45/08, 45/02*
U.S. Cl. 72—39 **9 Claims**



1. In an apparatus for applying a continuous wall of relatively high pressure volume of liquid to a surface of an elongated workpiece of hot metal passing above or below and adjacent to said apparatus to substantially and uniformly remove oxide scales from said surface where there is relative movement between said workpiece and said apparatus, comprising:

header means spaced from said surface and arranged to extend transversely across said workpiece,

said header means comprising:

nozzle means carried by said header means having an elongated exit opening extending parallel to said header for directing said high pressure volume continuous wall of liquid onto said surface of said workpiece,

channel means extending through said header means in said transverse direction for receiving pressurized liquid, and

liquid diffusion and pressure equalizing means in said header means communicating with said channel means, comprising

a series of parallel liquid passages each with a discharge opening formed in a common portion of said channel means and having a pressure equalizing effect on said liquid,

chamber means constructed and arranged to have an enlarged area relative to each adjacent said discharge opening formed by said passages for receiving said flow of liquid from said passages, said enlarged area having a back portion,

said passages being directed toward said back portion of said enlarged area to direct said flow in a first direction in said chamber means thereby effecting a further pressure equalization of said flow,

liquid directing means received in said enlarged area of said chamber means for directing said flow of liquid in a subsequent second direction substantially different from said first direction to further effect a pressure equalization of said flow, and

said liquid directing means forming a restriction area with said enlarged area for influencing the flow of liquid after passing in said second direction and for directing said liquid from said enlarged area into said nozzle means,

said channel means, said chamber means, and said elongated exit opening of said nozzle means being in substantial alignment relative to each other,

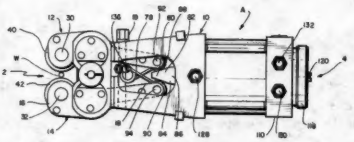
said nozzle means in conjunction with said treatment of the liquid in said chamber means causing said liquid passing through said nozzle means to form a rectangular, continuous field of pressurized liquid sufficient to create a high energy impact force within the rectangular field for said substantial and uniform removal of oxide scale from said surface of said workpiece.

4,617,816

THREAD ROLLING ATTACHMENT

Robert J. Brinkman, Rush, N.Y., assignor to C. J. Winter Machine Works, Rochester, N.Y.

Filed Feb. 5, 1985, Ser. No. 698,540
Int. Cl.[4] B21H *3/04*
U.S. Cl. 72—104 **10 Claims**



1. An outboard thread rolling attachment for an automatic screw machine for rolling a pattern on a workpiece comprising:

(a) a roll arm yoke having two, spaced, parallel arms, one of which is split into two sections,

(b) a pair of roll arms pivotally supported intermediate their ends on a pair of spaced, generally parallel fulcrum pins which extend transversely between the arms of said yoke,

(c) each of said roll arms having an inner end and an outer end,

(d) each of said outer ends of said roll arms having a shaft rotatably mounted thereon,

(e) a thread roll fixed on each of said shafts adjacent one end thereof,

(f) said rolls being diametrically opposed to each other relative to the axis of rotation of a workpiece placed therebetween,

(g) each of said shafts having gear means interconnecting one shaft with the other shaft,

(h) a fluid pressure cylinder means including reciprocable piston means, and wedge means operatively connected to said piston means for reciprocation thereby, and being in contact with and operable on and between the inner ends of said roll arms,

(i) said piston means including means for adjusting the travel of said wedge means,

(k) means mounting opposite ends of said fulcrum pins in the arms of said yoke for limited universal movement relative thereto, and

(l) taper adjusting means interconnecting said two sections of said one arm of said yoke and adjustable to tilt the axes of said fulcrum pins relative to one another.

4,617,817

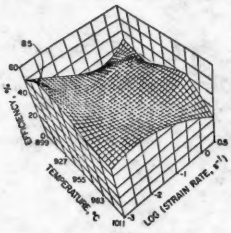
OPTIMIZING HOT WORKABILITY AND CONTROLLING MICROSTRUCTURES IN DIFFICULT TO PROCESS HIGH STRENGTH AND HIGH TEMPERATURE MATERIALS

Harold L. Gegel, Kettering; James C. Malas, Dayton; Yellapregada V. R. K. Prasad, Fairborn; Sokka M. Doraivelu, Beavercreek; Douglas R. Barker, Centerville; James T. Morgan, Jr., Huber Heights, and Kristine A. Lark, Enon, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 6, 1985, Ser. No. 698,728

Int. Cl.[4] B21J *5/00*

U.S. Cl. 72—364 **40 Claims**



1. A method of fabricating an article from a metallic material, comprising the steps of:

a. generating flow stress data as a function of strain rate and temperature on samples of said material at predetermined strain within predetermined ranges of temperature and strain rate;

b. determining from said data the strain rate sensitivity and defining power dissipation efficiency as a function of temperature and strain rate for said material within said ranges of temperature and strain rate;

c. selecting values of strain rate and corresponding temperature for a selected value of said power dissipation efficiency; and

d. hot forming said material at said selected strain rate and temperature values to a predetermined shape for said article.

4,617,818

STRUCTURAL METAL SHEET AND METHOD FOR FORMING THE SAME

Kazusige Fukuyori, Kudamatsu, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1983, Ser. No. 520,850

Claims priority, application Japan, Aug. 16, 1982, 57-141111

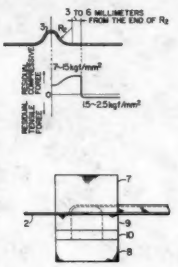
Int. Cl.[4] B21D *17/02*

U.S. Cl. 72—379 **3 Claims**

1. A method for forming a structural metal sheet provided with both a bead portion in which residual compressive stress exists and a flat portion in which residual tensile stress exists, comprising the steps of:

plastically working a sheet material for forming said bead portion,

applying to said bead portion a compressive stress several times as large as the yield point or proof stress of the sheet material so that the residual compressive stress occurs in



the bead portion after removing the application of the compressive stress.

4,617,819

WIRE CUTTING AND FORMING MACHINE WITH BALANCED MASSES

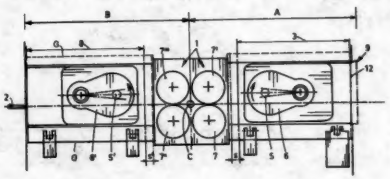
Albino Castiglioni, Via Losanna 12, 6900 Lugano, Switzerland

Filed Aug. 21, 1984, Ser. No. 642,769

Claims priority, application Switzerland, Aug. 23, 1983, 4587/83

Int. Cl.[4] B21D *7/06*

U.S. Cl. 72—407 **4 Claims**



1. In a machine for the continuous cutting and cold pressing of material supplied in the form of wire, the machine having a plurality of wire feed rolls for intermittently feeding wire toward a cutting and cold pressing station, a cold pressing punch holder slidably mounted on the machine, and means for reciprocating the punch holder in a direction toward and away from the wire feed rolls and parallel to the direction of advance of the wire; the improvement comprising a body of substantially the same mass as the punch holder, said feed rolls being disposed between said body and said punch holder, said body being mounted on the machine for sliding movement toward and away from the feed rolls in a direction parallel to the direction of movement of the wire, and means for reciprocating said body equal distances as, but in opposite directions from, said punch holder, said body and said punch holder being disposed at all times equal distances from said wire feed rolls.

4,617,820

LEVEL CALIBRATING DEVICE

Richard D. Hammond, 2308 Concord, Las Cruces, N. Mex. 88001

Filed Aug. 6, 1985, Ser. No. 763,055

Int. Cl.[4] G01C *25/00*

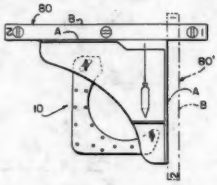
U.S. Cl. 73—1 E **10 Claims**

1. A level checking device to determine the accuracy of a hand held level, comprising:

a main body portion having two planar surfaces which are normal to one another, one of said surfaces establishing a

horizontal reference and the other of said surfaces establishing a vertical reference;

a mounting bracket connected to said main body and adapted for connection to a solid support structure;



means for adjusting the orientation of said main body relative to said mounting bracket in order to adjust said main surfaces to act as horizontal and vertical references, respectively; and

means connected to said main body to indicate when said surfaces are horizontal and vertical, respectively.

4,617,821

GAS DETECTING DEVICE

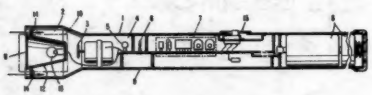
Meiso Yokoyama; Makoto Takahashi; Tsunehiko Nishiwaki, and Makoto Imai, all of Nagaoka, Japan, assignors to Nippon Seiki Co., Ltd., Niigata, Japan

Filed Feb. 13, 1985, Ser. No. 701,217

Claims priority, application Japan, Feb. 24, 1984, 59-26233[U]; Feb. 25, 1984, 59-26566[U]; Mar. 24, 1984, 59-42476[U]

Int. Cl.⁴ G01N *31/00*

U.S. Cl. 73—23 **5 Claims**



1. In a gas detecting device including a cylindrical member formed with an inlet opening through which exhalation gas of a person to be tested for alcohol level enters said cylindrical member, and an air blower for drawing the exhalation gas towards a gas detecting element contained in said cylindrical member and connected to a power source, the improvement which comprises an illuminating section located inside said cylindrical member and connected to said power source for providing illumination forwardly of said inlet opening of said cylindrical member, wherein said illuminating section includes a light source, a substantially conical reflecting plate for reflecting light from said light source, said reflecting plate having a forward opening through which light passes from the light source to illuminate the mouth of a person for measurement of exhalation gas with said gas detecting device spaced from the person in alignment with the mouth of said person by means of light from said light source.

4,617,822

TELL-TALE WEAR MONITOR FOR PIPES HAVING WEAR RESISTANT INNER LININGS

Thomas E. Davis, Anderson, Ind., assignor to Cerline Ceramic Corporation, Anderson, Ind.

Filed Aug. 20, 1985, Ser. No. 767,520

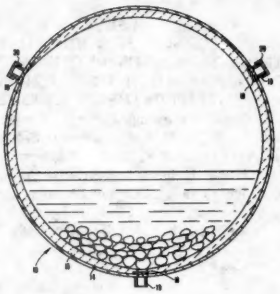
Int. Cl.⁴ F16L *55/00*

U.S. Cl. 73—40.5 R **18 Claims**

1. An apparatus, comprising:

a pipe section for conveying of highly abrasive materials from one location to another, said pipe section having an outer shell and an inner lining, said inner lining made of a material which, relative to said outer shell, is more resistant to wear from abrasive contact with the material conveyed within said pipe section, said outer shell defining a hole therethrough extending between said inner lining and the exterior of said outer shell; and

a plug member positioned between said inner lining and outer shell and covering the inside facing opening of said



hole, said inner lining formed around said plug member and having a thickness which is reduced in the area of said hole by said plug member, said plug member made of a material which, relative to said inner lining material, is readily worn away by abrasive contact with the material conveyed within said pipe section, whereby, when said plug member is worn through, fluid flow is permitted through said hole.

4,617,823

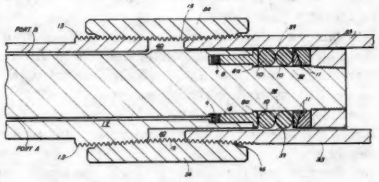
HYDRO PRESSURE THREAD TESTER

Richard J. Lazes, 2748 Orchid St., New Orleans, La. 70119

Filed Feb. 4, 1985, Ser. No. 698,030

Int. Cl.⁴ G01M *3/28*

U.S. Cl. 73—46 **7 Claims**



1. An apparatus for hydrostatically testing the pipe threads on an end of a length of pipe onto which a coupling is threadably adapted comprising: a cylindrical body member that is inserted inside said end of said pipe and having provided therein a hydraulically activated pressure resistant first sealing means that contact a plurality of second sealing means arranged annularly of said cylindrical body member between a flanged portion of said first sealing means and the first end portion of said cylindrical body member, whereby said second annular sealing means are forced outwardly and into contact with the inner surface of said pipe being tested, thereby sealing off the interior of said pipe so as to isolate a test fluid introduced under pressure to the area surrounding the connection between said pipe and said cylindrical body member, a cylindrical nipple-like third pressure resistant sealing means arranged at the opposite end of said cylindrical body member that threadably engages the exposed interior threads of said coupling, and a fluid passageway provided in said cylindricaal

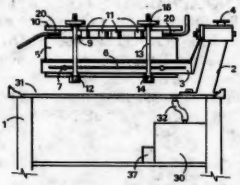
body member for introducing said testing fluid under pressure into said annulus created between said hydraulically activated first sealing means and said cylindrical nipple-like third sealing means.

4,617,824

CYLINDER HEAD PRESSURE TESTING APPARATUS

Laurence P. Cybulski, and Robert R. McGlogan, both of Kitchener, Canada, assignors to R.R. McGlogan Equipment Ltd., Kitchener, Canada

Filed Jun. 21, 1985, Ser. No. 747,808
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—49.7 2 Claims



1. Apparatus for pressure testing of a cylinder head for leak detection, comprising:

air pressure supply means for connection to an air pressure source;

liquid supply means, including a pump;

a diversion valve connected to said air pressure supply means and said pump for receiving air from said air pressure supply means and liquid from said pump, and an outlet from said diversion valve for supplying air pressure or liquid as selected;

cylinder head inlet means sealingly connected for communication between said diversion valve outlet and a water passage port in said cylinder head;

an outlet valve;

cylinder head outlet means sealingly connected for communication between said outlet valve and another water passage port in said cylinder head; and

plug means for sealing all other water passage ports in said cylinder head;

whereby said cylinder head may be filled with liquid or air and then pressurized by air by operating said diversion valve and said outlet valve to fill said cylinder head and thence pressurize said cylinder head by supplying pressurized air through said diversion valve with said outlet valve closed;

said plug means for sealing said water passage ports comprising:

a clamping plate for disposition parallel to the machined surface of the cylinder head;

at least two crossbar members for disposition across the side of the cylinder head opposite the clamping plate;

for each end of each crossbar member, a clamping member connected to said crossbar member for projection upwardly beyond said clamping plate;

a clamping screw threaded onto the end of each clamping member beyond said clamping plate for clamping said plate towards said crossbar members;

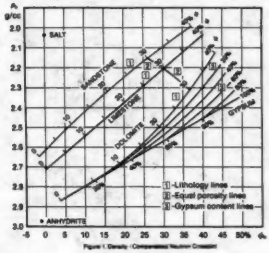
whereby sealing plugs may be positioned for compression between said machined surface of said cylinder head and said clamping plate for sealing said water passage ports.

4,617,825

WELL LOGGING ANALYSIS METHODS FOR USE IN COMPLEX LITHOLOGY RESERVOIRS

Naum Ruhovets, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 12, 1985, Ser. No. 775,294
Int. Cl.[4] G01V *5/00*
U.S. Cl. 73—152 3 Claims



1. A machine implemented iterative method of well log analysis to determine the volumes of anhydrite (or gypsum) in three mineral combination lithology utilizing well log measurements of gamma-gamma density, neutron and acoustic properties of earth formations in the vicinity of a well borehole comprising the steps of:

(a) obtaining a gamma-gamma density versus neutron porosity crossplot from the respective logs at a corresponding depth in the well borehole;

(b) determining ρ_{map} (the average density of rock matrix) and Δt_{map} (the average matrix acoustic travel time) by solving said crossplot for a two mineral lithology;

using the ρ_{map} and Δt_{map}, then determining the volume of anhydrite (or gypsum) present from the relationship given by

$$(\rho_{map}(1-Va)+\rho_a \cdot V_a-\rho_b)/(\rho_{map}-\rho_{af})=[\Delta t-(\Delta t_{map}(1-V_a)+\Delta t_a \cdot V_a)]/(\Delta t_f-\Delta t_{map})$$

where V_a is the volume of anhydrite in the formation; ρ_a is the density of anhydrite; ρ_b is the bulk density from the density log response; ρ_{af} is the electron density of the formation fluid; Δt is the acoustic travel time from the acoustic log response; Δt_a is the acoustic travel time of anhydrite; and Δt_f is the acoustic travel time in the formation fluid;

(c) using the V_a just computed, recompute the two mineral lithology volume for V_l (volume of limestone) from the relationship

$$V_l = V_f(1-V_a),$$

and;

repeating steps (b) and (c) using new values of ρ_{map} and Δt_{map} in an interative manner until the corrected values of V_a do not vary from repetition to repetition by more than a predetermined amount, thereby arriving at a value of V_a.

4,617,826

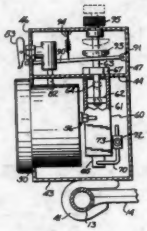
TEST SYSTEM FOR AIR DATA SENSOR

Floyd W. Hagen, Eden Prairie, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Mar. 30, 1984, Ser. No. 595,244
Int. Cl.[4] G01L *27/00, 7/00*
U.S. Cl. 73—182 2 Claims

1. A test system adapted to be used with a cylindrical probe having pressure sensing port means therein for sensing fluid pressures with ports being provided for sensing static pressure

and ports being provided for sensing positive pressures, said test system including a housing, said housing being mounted on said probe to be tested, a cylinder and piston assembly mounted in said housing and having a piston rod extending to the exterior of said housing, a screw threadably mounted on said housing engaging said piston rod and threadable to move said piston rod in one direction relative to the cylinder, said piston thereby generating a positive pressure on one side of the piston, on the interior of said cylinder and a negative pressure on an opposite side thereof, connection means for separately



connecting the interior portions of said cylinder on opposite sides of said piston at one side to a static pressure port and at the other side to a positive pressure port of the probe to be tested, respectively, bleed valve means in the means for connecting for bleeding each of the means for connecting to atmosphere, means independent of the screw for moving said piston rod in reverse direction from its movement caused by threading screw; and a pressure sensing indicator comprising an air speed indicator coupled for sensing differentials in pressure between the respective connection means for connecting the cylinder portion on opposite sides of the piston.

4,617,827

FLOWMETER SYSTEM

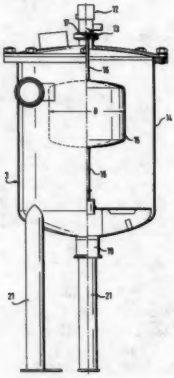
Helmut Grönke, Nordstemmen, Fed. Rep. of Germany, assignor to Diesel GmbH & Company, Hildesheim-Bavenstedt, Fed. Rep. of Germany

Filed Feb. 26, 1985, Ser. No. 705,641

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418446

Int. Cl.[4] G01F *15/08*

U.S. Cl. 73—200 **1 Claim**



1. In a flowmeter system for receiving liquids from stationary reservoirs onto tanker vehicles having a self-priming displacement pump followed by a deaerator, wherein a venting valve has an aperture with a given inside diameter mounted above a float having a given outside diameter acting on said valve, the deaerator being followed by a flowmeter which in turn is followed by a check valve, the improvement comprising:

said given inside diameter (**18**) of said venting valve (**13**) and said given outside diameter (D) of said float (**15**) in said deaerator (**3**), are related according to the following formula:

$$d^2/D^2 = p/78$$

wherein

d=said inside diameter of said aperture of said venting valve;

D=said outside diameter of said float;

p=pressure in bars generated in said deaerator by said displacement pump with pure air conveyance.

4,617,828

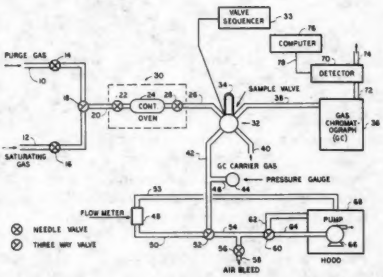
METHOD AND APPARATUS FOR DETERMINING THE SOLUBILITY OF VOLATILE MATERIALS IN NON-VOLATILE MATERIALS

Stephen R. Ellebracht, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 29, 1985, Ser. No. 717,401

Int. Cl.[4] G01N *7/00*

U.S. Cl. 73—866 **11 Claims**



1. A method of measuring the solubility of volatile materials in non-volatile materials at specified temperature and pressure conditions, said method being comprised of the steps of:

a. placing a sample of substantially solid non-volatile material inside a container which has sufficient volume to allow gases to flow through the container while contacting the non-volatile material and which has a gas inlet and a gas outlet by which gas can, respectively, flow into and out of the container;

b. flowing a gaseous saturating stream of a volatile material through the container in a manner so as to contact and be sorbed by the non-volatile material for a time sufficient for the non-volatile material to become virtually saturated with volatile material while maintaining the temperature and pressure of all material within the container at predetermined constant conditions;

c. stopping the flow of the saturating stream of volatile material;

d. flowing a purge gas through the container at a sufficiently high flow rate to substantially purge the container of its non-sorbed volatile materials but in a sufficiently short time so as not to appreciably reduce the amount of volatile materials sorbed by the non-volatile material, said purge gas being one which does not contain any of the volatile materials of the saturating stream in any significant amount as well as being one which is not reactive in any

significant amount with the volatile or non-volatile materials under the conditions used in this method;

e. continuously flowing a desorbing gas stream which has the same properties as those defined for the purge gas in step (d) above through the container in a manner and for a sufficient time so that the gas of the stream contacts the non-volatile material for a time sufficiently long so that substantially all of the volatile materials previously sorbed by the non-volatile material are desorbed from the non-volatile material into the flowing desorbing gas stream, said desorbing gas stream flow being maintained at a known flow rate so that the effect of its flow rate can be accounted for and disregarded in determining the amount of volatile material transferred to it from the non-volatile material per unit of time in the following steps;

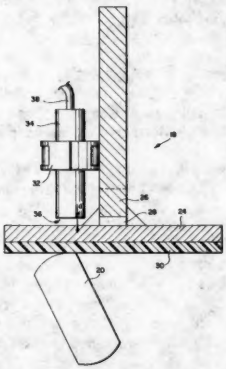
1. periodically taking incremental samples of known volumes from the desorbing gas stream flowing from the container;
2. flowing these known volume samples on through a gas chromatograph which has a detector which is sensitive to the volatile material but which is not significantly sensitive to the desorbing gas;
3. collecting enough sample data points from sub-step (1) above of the amount of volatile material present in each periodic desorbing gas sample to establish an integrable graphical curve, whether actual or present only in representative form within a computer, the ordinate of which curve representing the total time over which the samples were taken from the desorbing gas and the coordinates of the curve representing the amount of volatile material present in the incremental samples periodically taken from the desorbing gas stream;
4. integrating the curve to give the total amount of volatile material contained within the non-volatile material; and
5. dividing the amount of volatile material calculated in sub-step (4) above by the amount of non-volatile material to obtain the solubility of the volatile material in the non-volatile material at the specified temperature and pressure conditions.

4,617,829

DEVICE FOR MEASURING CLAMPING OF GRIPS NOTABLY OF A DETACHABLE GONDOLA LIFT OR CHAIR LIFT

Serge Tarassoff, Seyssinet, France, assignor to Pomagalski S.A., Fontaine, France

Filed Oct. 1, 1985, Ser. No. 782,303
Claims priority, application France, Oct. 15, 1984, 84 15868
Int. Cl.[4] G01P *1/00*
U.S. Cl. 73—865.8 **9 Claims**



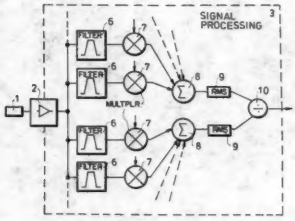
1. An aerial ropeway transport installation, notably a detachable chair lift or gondola lift, having grips coupling the chairs or cars to a rope, each grip having a spring urging the grip into a closing position clamping on the rope and an operating lever acting against the force of the spring to open the grip detaching it from the rope in the stations in a detachment section and commanding closing of the grip in an attachment section, said installation comprising in one of said sections a grip clamping measurement device made of a ramp actuating said operating lever when the grip passes said section and a detector of the deformation of said ramp having a part with a certain flexibility, said detector being a proximity detector disposed facing said part to measure the amplitude of the deformation of said part when the grip passes due to the action of the force exerted by said operating lever on the ramp.

4,617,830

METHOD AND APPARATUS FOR CHECKING HETEROGENEOUS TRANSFORMATION PROCESS OF DIFFUSING KINETICS IN TURBULENT LIQUID FLOW

Gábor Pál, Hómezó u.64, 1221 Budapest; Gábor Endröczi, Veres Pálné u. 14, 1053 Budapest; György Hollós, Frankel Leo u.23, 1023 Budapest; Gábor Nagy, Árpád u. 64; Gábor Szönyi, Stadion u. 23, both of 3534 Miskolc; Bódi László , Gyula u. 38, 3532 Miskolc, and Zoltán Balázs, Kóris Kálmán u. 17, 3530 Miskolc, all of Hungary

Filed May 7, 1985, Ser. No. 731,212
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—590 **9 Claims**



1. A method of checking a heterogeneous transformation process of diffusion kinetics taking place in a turbulent flow of a liquid, comprising the steps of detecting a vibration process of acoustic frequency caused by oscillations of bubbles present in said turbulent flow of liquid, producing an electric signal reflecting the spectral composition of said detected signal, and forming therefrom a measure signal reflecting the relative instantaneous value of the turbulent diffusion coefficient of said flowing liquid, for indirect real-time checking said transformation.

4,617,831

PUSH BUTTON TYPE TUNER

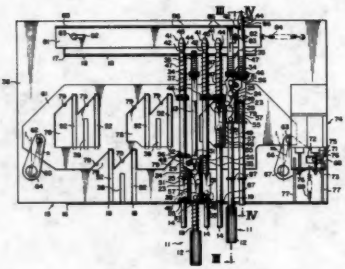
Tamaki Ohashi, Tokyo; Tsunefusa Suzuki, Wanabishi; Kaoru Nakada, Saitama; Nobuya Hoshi, Tokyo; Hisao Fujimura, Kanagawa, and Hiromitu Ui, Tokyo, all of Japan, assignors to Nihon Technical Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1984, Ser. No. 642,953
Int. Cl.[4] H03J *5/12*
U.S. Cl. 74—10.33 **16 Claims**

1. In a push button type tuner including supporting means, tuning means mounted on said supporting means to generate a tuned frequency and being movable to a position corresponding to the tuned frequency, and a plurality of presettable channel selecting mechanisms for selectively displacing the tuning means to the position corresponding to a frequency specified for each of said channel selecting mechanisms, the improvement comprising:

each of the channel selecting mechanisms comprising a rotatable actuating member displaceable between a fore inoperative position and a rear operative position relative to the supporting means, said actuating member being normally urged toward the fore inoperative position and including a main rotatable portion and a push button which serves as a rotary knob, said push button being fixedly secured to the foremost end of the actuating member,

the actuating member coacting with a pair of rotatable channel selecting members which are displaceable between the fore inoperative position and the rear operative position, said channel selecting members being so mounted on the supporting means that they are normally urged toward the fore inoperative position and each of the channel selecting members having a follower rotatable portion selectively engageable with the main rotatable portion to rotate with the latter, each of the channel selecting members having a longitudinally extending threaded portion on which is threadably mounted a channel selecting dog, said channel selecting dog being displaceable in the forward and rearward directions as the channel selecting member rotates,



an engagement mechanism mounted on the actuating member so as to effect engagement of the actuating member with the channel selecting members so that the latter are alternately displaced toward the rear operative position of the actuating member at every time when a cycle of forward and rearward movements of the actuating member between the fore inoperative position and the rear operative position is achieved,

the tuning means including an actuating plate engageable with the channel selecting dog on the channel selecting member which is located at the rear operative position to enable the tuning means to be adjusted by the actuating plate, and,

the tuner further including a locking member having means for allowing rotation of the main rotatable portion to be transmitted to the follower rotatable portion when one of the channel selecting members is located at the rear operative position and to unlock the one channel selecting member which has assumed the rear operative position from the locked state when the other channel selecting member reaches the rear operative position.

4,617,832

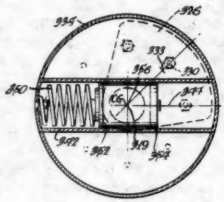
VIBRATORY APPARATUS HAVING VARIABLE LEAD ANGLE AND FORCE

Albert Musschoot, Barrington, Ill., assignor to General Kinematics, Barrington, Ill.

Continuation-in-part of Ser. No. 420,602, Sep. 20, 1982, Pat. No. 4,495,826, which is a continuation-in-part of Ser. No. 250,112, Apr. 2, 1981, abandoned. This application Mar. 12, 1984, Ser. No. 588,305

Int. Cl.[4] F16H *33/10*

U.S. Cl. 74—87 **5 Claims**



1. Apparatus for varying the lead angle and the amount of a vibratory force generated by a rotating mass comprising a rotatably mounted shaft, means for rotating the shaft, a device mounted on the shaft, a fixed weight, means mounting the fixed weight on the device for rotation with the shaft, an elongate cylinder on the device and having an elongate axis passing through the axis of rotation of the shaft at right angles to said axis of rotation, said fixed weight having a center of gravity radially of the axis of the shaft with a line connecting said axis of the shaft and the center of gravity establishing a base line, said base line and said elongate axis defining an angle therebetween that is greater than 0° and less than 180°, a movable weight mounted for axial movement in the cylinder, a tension and compression spring in the cylinder for urging the movable weight radially outboard of the axis of rotation of the shaft, said spring having its one end attached to the cylinder and its other end attached to the movable weight, said weight being movable upon compression of the spring to one side of the shaft axis and upon tensioning of the spring to the other side of the shaft axis and means operable to move the movable weight inboard toward said shaft or outboard away from said shaft whereby the lead angle of the vibratory force will be along the resultant between the base line and the elongate axis in non-coincidence with the elongate axis of the cylinder and in an amount determined by the relative locations of the fixed weight and the movable weight.

4,617,833

HIGH PRECISION ADJUSTER

Kenneth F. Hall, and George Chambers, both of Martock, England, assignors to Martock Design Limited, Martock, England

Filed Sep. 10, 1984, Ser. No. 648,499

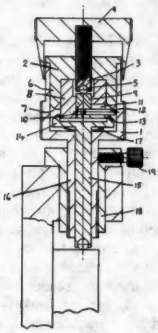
Claims priority, application United Kingdom, Jan. 7, 1984, 8400352

Int. Cl.[4] F16H *21/44*

U.S. Cl. 74—110 **10 Claims**

1. A high precision linear motion adjuster comprising: a body having an axis, a primary motion member having a screw-threaded portion in threaded engagement with said body, said member having a thrust-imparting spigot coaxial with said axis and with the threaded portion, an output member slidable in said body, and an intermediate lever system located within said body and positioned between said spigot and output member, said lever system including at least one substantially straight lever extending transversely of said axis,

said lever pivotable about a fulcrum carried by said body and effective to translate through radially fixed pivots a relatively



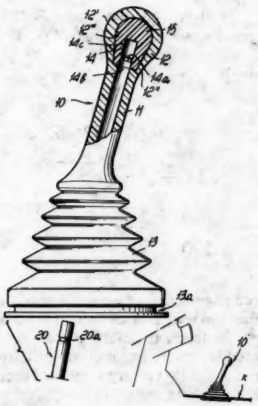
large movement of the primary motion member into a relatively small movement of the output member.

4,617,834

PREFORMED INTEGRAL COATING, PARTICULARLY FOR MOTORVEHICLE GEAR SHIFT LEVERS

Giovanni Foggini, Corso Matteotti, 23, Torino, Italy

Continuation of Ser. No. 360,040, Mar. 19, 1982, abandoned.
This application Feb. 19, 1985, Ser. No. 703,163
Claims priority, application Italy, Apr. 1, 1981, 53070/81[U]
Int. Cl.[4] G05G *1/06*; B60K *20/00*
U.S. Cl. 74—523 **1 Claim**



1. Pre-formed sheath-like structure, particularly for motor vehicle gear shift levers of the type having a hand actuated rod member with a rod diameter and a rod member axis, said sheath-like structure comprising a one piece coating member portion of soft polymeric material and a core member portion of hard polymeric material,

said one piece coating member protion having an axis coinciding in use with said rod member axis, an upper portion defining a knob grip formation of generally bell-like shape coaxial with said rod member axis and having a rounded top and downwardly frustoconically converging mantle formation and a hollow seat therein, said seat having a shape corresponding to said bell-like shape and being coaxial therewith, the axial extension of said seat being greater than any transverse extension thereof,

said one piece coating member portion having further an intermediate sleeve portion departing from said converging mantle formation, as an integral undivided part thereof, said intermediate sleeve portion having a constant thickness and defining internally a cylindrical hollow space having a diameter corresponding to the diameter of said gear shift lever rod member,

a lower bellows-like portion departing from said intermediate sleeve portion as an integral undivided part thereof, said bellows-like portion having a wall thickness smaller than said constant thickness of said intermediate sleve portion and a downwardly diverging frustoconical shape, said bellows-like portion having further an annular lower groove formation concentric therewith in proximity of a lower edge of said bellows-like portion and for engagement in use with an edge of an opening of a console of the motor vehicle,

said core member portion of hard polymeric material being embedded in said hollow seat and counter-shaped to said seat and structurally in co-molded relationship with said one piece coating member portion thereby to strengthen the connection between said core member portion of hard polymeric material and said one piece coating member portion of soft polymeric material, said core member portion having a cylindrical cavity coaxial with said one piece coating member portion axis, said cavity having a diameter corresponding to said rod member diameter and an axial extension substantially greater than said rod diameter, said cylindrical cavity having an open end at a zone where said intermediate sleeve portion departs from said frustoconically converging mantle and an opposite dead end at a section where said rounded top passes into said frustoconically converging mantle, said cylindrical cavity having further an inwardly protruding concentrically arranged

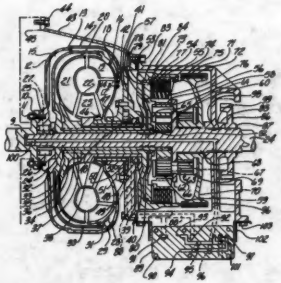
annular ridge having a diameter smaller than the diameter of said cylindrical cavity, said cylindrical cavity being coaxial with said cylindrical hollow space, thereby said cylindrical cavity and said cylindrical hollow space constituting a continuation of each other for receiving therein in use said rod member in fitting engagement therewith, said annular ridge being arranged to be received in a fitting relationship therewith into a circumferential groove provided near a free end of said rod member.

4,617,835

TRANSMISSION

Herbert K. Baker, deceased, late of Oak Park, and by Harriett V. Baker, heir, 24481 Republic, Oak Park, both of Mich. 48237

Continuation of Ser. No. 253,038, Apr. 10, 1981, abandoned.
This application Jul. 16, 1984, Ser. No. 631,445
Int. Cl.[4] F16H *47/04*
U.S. Cl. 74—677 **5 Claims**



1. In combination:

a housing,

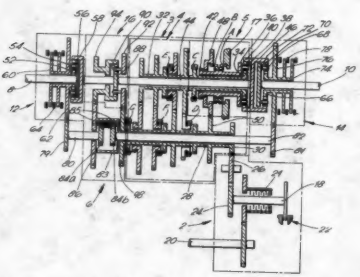
an input drive shaft extending into the housing,
an output shaft extending outwardly from the housing,
a hydraulic converter assembly comprising a first stage annular vaned impeller coupled to said input shaft, a second stage annular vaned impeller arranged to receive fluid from the first impeller, a vaned turbine arranged to receive fluid from the second impeller, a vaned reaction member arranged to receive fluid from the turbine, and a one-way brake coupled to said vaned reaction member which enables free wheeling of the reaction member in only one direction,
an infinitely variable gear arrangement comprising a feedback sun gear drivingly connected to said second impeller, a ring gear, means for drivingly connecting said ring gear to said turbine, a carrier connected to said output shaft, at least one pair of intermeshed pinions rotatably mounted to the carrier, one of said pinions being meshed with the sun gear and the other pinion meshed with the ring gear, and
wherein said sun gear rotatably drives said second stage impeller at a speed greater than the first stage impeller so that, at a predetermined fluid clutching match point, the discharge fluid velocity from the turbine substantially equals the inner fluid velocity of the first state impeller,
selectively operable clutch means movable between an engaged position and a disengaged position for drivingly connecting said turbine to said ring gear only when said clutch means is in said engaged position,
wherein said clutch means further comprises a plurality of enmeshed clutch plates and means to compress said clutch plates together,
wherein said compressing means further comprises a fluid operated piston movable between a first and a second position wherein said first position said clutch means is in said disengaged position and wherein in said second position said clutch means is in said engaged position,
wherein said transmission is used in conjunction with a vehicle having a throttle, said throttle being movable between an idle position and a depressed position and furher comprising a hydraulic system means responsive to the movement of the throttle away from said idle position for actuating said piston so that said piston moves from said first and to said second position.

4,617,836

TRANSMISSION SYSTEMS FOR TRACKED VEHICLES

David A. Baldwin, Woking, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jul. 11, 1984, Ser. No. 629,972
Claims priority, application United Kingdom, Jul. 12, 1983, 8318862
Int. Cl.[4] F16H *37/06*
U.S. Cl. 74—682 **3 Claims**



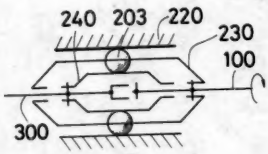
1. A transmission system having
a rotatable power input member;
a change-speed gear unit coupled to the power input member;
a gear unit output member rotatably drivable by the gear unit;
a steering differential having a rotatable steering input member coupled to the power input member and having a first and a second rotatable steering output member arranged so that the sum of their rotational speeds is proportional to the rotational speed of the steering input member;
a first and a second drive differential coupled to the gear unit output member and the first and second steering output member, respectively, and having a first and a second rotatable output member, respectively, the first and second drive differentials being configured such that the rotational speed of the first and second output members is equal to a linear combination of the rotational speeds of the gear unit output member and of the first and second steering output member, respectively;
a first and a second steering brake associated with the respective steering output members; and
a modifying differential coupled to the gear unit output member, the power input member and the steering input member;
the modifying differential being arranged so that the rotational speed of the steering input member is equal to a multiple of the rotational speed of the power input member less a multiple of the rotational speed of the gear unit output member when a forward gear ratio is engaged.

4,617,837

SPEED CHANGE DEVICE FOR MEDICAL HANDPIECE

Kenzo Kataoka, Otsu, and Hiroo Watanabe, Kyoto, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Feb. 13, 1985, Ser. No. 701,086
Claims priority, application Japan, Feb. 18, 1984, 59-29244
Int. Cl.[4] F16H *57/10*
U.S. Cl. 74—785 **2 Claims**



1. A speed change device for a medical handpiece arranged such that first and second rotary shafts are connectably carried by bearings and freely rotatably in a case of a handpiece and are connected for transmission of torque at the same, faster or slower speed as the first rotary shaft, said speed change device being characterized in that:
it comprises on and between said first and second rotary shafts in said case a planetary torque transmission mechanism, which enables transmission of torque of said first rotary shaft on the driving side to said second rotary shaft on the driven side at the same, faster or slower speed as the first rotary shaft, said planetary torque transmission mechanism is of the ball planetary type and comprises an outer race freely slidable axially, a ball retainer retaining a ball free to roll and in rolling contact with a peripheral groove inside said race and inner race whose outer peripheral groove corresponds to said peripheral groove of said outer race;
on the outer periphery of said case a manipulating means for selecting either the same, faster or slower speed as the first rotary shaft whereby through manipulation of said manipulating means said first and second rotary shafts are connected directly, connected by said planetary torque trans-

mission mechanism or shifted for disconnecting said first and second rotary shafts so that said first and second rotary shafts are then connected indirectly through said planetary torque transmission mechanism; and

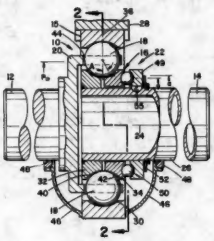
said first and second rotary shafts are provided with first and second engaging sleeves fitted respectively thereover, said first and second engaging sleeves being mutually engageable at face-to-face ends, peripherally rotatable together with said first and second rotary shafts and slidable in an axial direction via slots, pin means respectively fitted in said slots, and first and second springs for urging said first and second sleeves into engagement.

4,617,838

VARIABLE PRELOAD BALL DRIVE

William J. Anderson, North Olmsted, Ohio, assignor to Nastec, Inc., Cleveland, Ohio

Filed Apr. 6, 1984, Ser. No. 597,609
Int. Cl.[4] F16H *13/06*
U.S. Cl. 74—798 **8 Claims**



1. A fixed ratio ball drive having first and second relatively rotatable shafts, each shaft operating as either an input or output shaft, a pair of concentric annular race nembers, one of said race members being fixed against rotation and defining a unitary, axially undivided raceway, the other of said race members defining a spaced facing raceway, a plurality of torque balls retained in said raceways, a drive member connected to said first shaft having means circumferentially spacing and drivingly engaging said torque balls, both of said raceways having a radius of curvature greater than said torque ball radius, said other race member consisting of first and second race rings relatively axially movable along said second shaft to compressively radially engage the torque balls at a predetermined substantially fixed contact angle, the first race ring being fixedly rotatably connected to said second shaft, the second race ring being rotatable with and axially slidable relative to said second shaft;

a preload ring carried and driven by said second shaft, said preload ring being axially spaced from and axially shiftable relative to said second race ring;

a circumferentially spaced series of circumferentially extending opposed ramp surfaces formed in opposed axial surfaces of said rings, said ramp surface being inclined at a predetermined angle relative to the radial plane of said rings;

preload balls retained between said opposed ramp surfaces establishing rolling axial driving engagement between said rings between said ramp surfaces;

spring means operative between said preload ring and said second shaft exerting an axial force on said second race ring through said preload ring and preload balls toward siad first race ring to create a frictional force between said raceways and said torque balls just sufficient to transmit minimum expected torque demands on said drive;

said predetermined angle of inclination being related to said preload balls such that an applied greater than minimum torque demand on said drive, when transmitted to said preload ring as driven by said second shaft, results in rolling movement of said preload balls between said ramp surfaces; and,

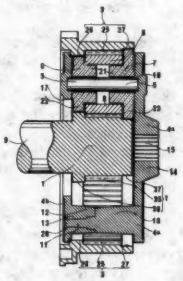
said rolling movement of said preload balls providing an additional axial force in proportion to said applied torque which, with said spring force, provides a combined axial force to increase the friction between said torque balls and said raceways to a level which is sufficient to maintain rolling driving engagement therebetween at said substantially fixed contact angle.

4,617,839

ASYMMETRIC PLANETARY GEAR ASSEMBLY

Hideyasu Matoba, Osaka, Japan, assignor to Matex Co., Ltd., Osaka, Japan

Filed Jun. 21, 1985, Ser. No. 747,172
Claims priority, application Japan, Jul. 19, 1984, 59-150145
Int. Cl.[4] F16H *1/28, 3/44*
U.S. Cl. 74—801 **7 Claims**



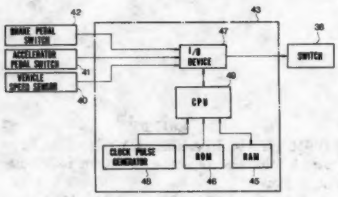
1. An asymmetric planetary gear assembly comprising a sun gear **(1)**, three or four planetary gears **(2)** for engaging with the sun gear **(1)**, an outer inner-toothed gear **(3)** engaging with the planetary gears **(2)** and a rotary carrier **(4)** supporting planetary shafts **(5)** piercing the planetary gears **(2)**, characterized in that the planetary gear **(2)** consists of a planetary gear ring **(8)**, a first planetary disc **(6)** having a smaller disc part **(22)** smaller than the tooth-root circle of planetary gear and an inner cylindrical part **(21)** sustaining the planetary gear ring **(8)** and a second planetary disc **(7)** having a bigger disc part **(23)** bigger than the tooth-edge circle of planetary gear and an inner cylindrical part **(21)** sustaining the planetary gear ring **(8)**, the outer inner-toothed gear consists of a gear part **(25)** engaging with the planetary gear ring **(8)**, a smaller cylindrical part **(26)** which is smaller than the tooth-edge circle of outer inner-toothed gear and contacts with the smaller disc part **(22)** of the first planetary disc **(6)**, and a bigger cylindrical part **(27)** which is bigger than the tooth-root circle of outer inner-toothed gear and contacts with the bigger disc part **(23)** of the second planetary disc **(7)**, and the sun gear **(1)** consists of a sun gear part **(35)** engaging with the planetary gear ring **(8)**, a smaller column part **(37)** which is smaller than the tooth-root circle of sun gear and contacts with and rolls on the bigger disc part **(23)** of the second planetary disc **(7)** and a bigger column part **(36)** which is bigger than the tooth-edge circle of sun gear and contacts with and rolls on the smaller disc part **(22)** of the first planetary disc **(6)**.

4,617,840

SYSTEM FOR CONTROLLING A POWER TRANSMISSION OF A FOUR-WHEEL DRIVE VEHICLE

Toru Yamakawa; Fujio Makita, both of Hachioji; Mitsuo Umezawa, and Ryuzo Sakakiyama, both of Tokyo, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,717
Claims priority, application Japan, Dec. 15, 1982, 57-219630
Int. Cl.[4] B60K *41/02*
U.S. Cl. 74—865 **11 Claims**



1. A system for controlling power transmission of a four-wheel drive vehicle powered by an engine comprising:

a transmission for transmitting power of said engine to main wheels of the vehicle;

a clutch for selectively transmitting said power to auxiliary wheels of the vehicle;

first sensing means for sensing the speed of the vehicle and for producing a signal dependent of the speed;

means responsive to the signal from said first sensing means for detecting the deceleration of said vehicle and for producing an output signal when the deceleration exceeds a predetermined value; and

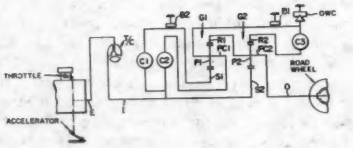
switch means responsive to said output signal for engaging said clutch, whereby the four-wheel driving power transmission is established.

4,617,841

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION WITH SHOCKLESS 4-2 SHIFTING

Kazuhiko Sugano, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 17, 1984, Ser. No. 581,508
Claims priority, application Japan, Feb. 28, 1983, 58-30691
Int. Cl.[4] B60K *41/08*; F16H *57/10*
U.S. Cl. 74—869 **4 Claims**



1. A hydraulic control system for an automatic transmission which is shiftable into a nth speed ratio, a n+1th speed ratio and a n+2th speed ratio, the automatic transmission including a first friction unit and a second friction unit, the first friction unit being engaged and the second friction unit being released during operation with the nth speed ratio, the first and second friction units being engaged during operation with the n+1th speed ratio, the first friction unit being released and the second friction unit being engaged during operation with the n+2th speed ratio,

the hydraulic control system comprising:

means for generating an actuating fluid pressure;

a first shift valve having a downshift position thereof and an upshift position thereof, said first shift valve assuming the downshift position thereof during operation with the nth speed ratio, said first shift valve assuming the upshift position thereof during operation with the n+1th speed ratio and the n+2th speed ratio;

a second shift valve having a downshift position thereof and an upshift position thereof, said second shift valve assuming the downshift position thereof during operation with the nth speed ratio and the n+1th speed ratio, said second shift valve assuming the upshift position thereof during operation with the n+2th speed ratio;

said second shift valve having a first port and a second port, said first port being allowed to communicate with said second port when said second shift valve assumes the downshift position thereof, said first port communicating with the first friction unit, said second port communicating with said actuating fluid pressure generating means;

means for generating a signal fluid pressure; and

a changeover valve means communicating with said first port and responsive to a fluid pressure in said first port for supplying said signal fluid pressure to urge said first shift valve toward the downshift position thereof when the fluid pressure in said first port rises above a predetermined value.

4,617,842

COMBINATION CAN OPENER

James C. H. Yang, 23328 Dorset Pl., Harbor City, Calif. 90710

Filed Nov. 5, 1984, Ser. No. 668,309
Int. Cl.[4] B67B *7/44*
U.S. Cl. 81—3.09 **5 Claims**

1. A combination cap and can opener suitable for opening a capped bottle and for opening a press-off easy-open can having a can cap (11) with a can seal (12) which can be split off from the can cap (11), the can also having a tab (21) connected to the can cap (11), the tab (21) having a lip (22) and a front end (23), the lip (22) being capable of being forced upward so that the front end (23) of the tab (21) pushes down on the can seal (12) to split off the can seal (12) and force the can seal (12) inside of

the can, the opener also being suitable for wrenching off a bottle cap (52) from a bottle (51),

the opener comprising a gripper (41) having a front section (44) and a tail end (43), the front section comprising:

(a) a forwardly projecting lance (422) having an upper edge (423) and a bottom edge (424), the two edges meeting to form an acute angle at an end edge (422*c*);

(b) an arched jaw (421) extending above and forwardly of the lance (422), the jaw (421) having a base portion (421*a*) and a front tip portion (421*b*), the front tip portion (421*b*) arching forwardly and downwardly toward the lance (422);

(c) a projection (421*c*) on the base portion (421*a*) of the jaw (421);

(d) a fillister (422*b*) between the projection (421*c*) and the lance (422), the fillister (422*b*) being sized and shaped for catching the lip (22) of the tab (21) of a press-off easy-open can,

wherein the thickness of the end edge (422*c*) of the lance (422) is less than about half of the thickness of the lip (22) of the tab (21) so that the lance (422) can be inserted beneath the tab (21) for pushing the lip (22) of the tab (21) upwardly, and

wherein the distance between the fillister (422*b*) and the front tip portion (421*b*) of the jaw (421) is slightly less than the length of the tab (21) and the length of the jaw (421) is sufficiently short such that when the lip (22) of the tab (21) is caught in the fillister (422*b*) and the tail end (43) of the gripper (41) is lifted, the front tip portion (421*b*) presses down to force the can seal to split off rapidly from the can without the jaw (421) reaching inside of the can; and

(e) means for wrenching off a bottle cap (52) from a capped bottle (51), the wrenching means being formed by the jaw (421) and the lance (422), the front tip portion (421*b*) of the jaw (421) projecting forwardly of the lance (422) a sufficient amount and curving downwardly toward the lance (422) a sufficient amount that when the lance (422) is under a bottle cap (52) on a bottle (51), the front tip portion (421*b*) of the jaw (421) is on top of the bottle cap (52), the projection (421*c*) not interfering with the lance (422) being placed under the bottle cap (52).

4,617,843

ELECTRICALLY-OPERATED DRIVER

Yoshikazu Nishida, Hirakata, and Isamu Hashimoto, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 12, 1985, Ser. No. 796,764

Claims priority, application Japan, Nov. 16, 1984, 59-242836

Int. Cl.[4] B25B *17/00*

U.S. Cl. 81—57.11 **5 Claims**

1. A push-start type electrically-operated driver comprising:

a motor;

a reduction gearing for said motor;

a clutch for transmitting drive force from said motor off and on;

a bit adapted to engage a screw, nut and the like for transmitting a torque thereto;

a switch for turning on and off said motor; and

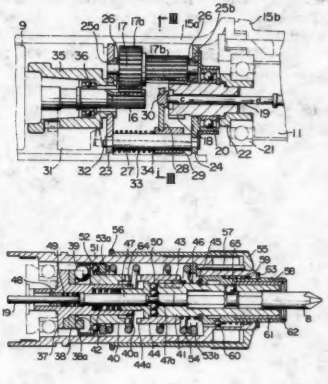
a cover for enclosing all the parts of the electrically-operated driver, said motor being turned on as a pressure is applied to said bit to cause a switch rod to move and actuate said switch;

characterized in that:

said reduction gearing comprises a plurality of spur gears, said spur gears each being rotatable about a center axis thereof but prevented from moving in an orbit;

said switch is located close to said reduction gearing; and

switch operating means is incorporated in said reduction gearing, said switch operating means being operative to



actuate said switch upon said bit moving in an axial direction.

4,617,844

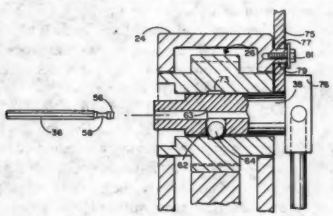
REMOVABLE KEY FOR WRENCHING TOOL

Ronald W. Batten, Torrance, Calif., assignor to VSI Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 514,783, Jul. 18, 1983, Pat. No. 4,538,483. This application Feb. 19, 1985, Ser. No. 702,959

Int. Cl.[4] B25B *13/48, 15/00*

U.S. Cl. 81—436 **14 Claims**



1. An elongated key for removable engagement in a tool having a tool subassembly of an outer member and an elongated key holder slidably received therein, a ball detent keyway formed by a receiving bore in said key holder and a detent ball receptacle intersecting said receiving bore with a detent ball seated in said receptacle and a ball recess in said outer member, said elongated key comprising:

a main shaft portion having a non-circular cross section to index in said receiving bore,

a work end with a torque transmitting head;

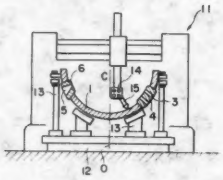
an opposite end from said work end having a reduced thickness whereby said key may be canted in said receiving bore and having a sufficient length to engage said ball in its canted position; and

a transverse groove between said opposite end and said main shaft portion; whereby said key, when inserted into said receiving bore, is operative to slide said holder to a position permitting said ball to be received in said ball recess of said outer member and permit passage of said opposite end past said ball, by the application of an axial force to the key.

4,617,845
METHOD AND APPARATUS FOR WORKING PERIPHERAL WALL OF HEMISPHERICAL SHELL

Ryoichiro Sasano; Tsutomu Toyohara, and Toshimichi Takigawa, all of Kobe, Japan, assignors to Mitsubishi Jukogio Kabushiki Kaisha, Japan

Filed Mar. 26, 1984, Ser. No. 593,628
Claims priority, application Japan, Mar. 29, 1983, 58-51574
Int. Cl.[4] B23B *1/00, 3/28, 5/40*
U.S. Cl. 82—1 C 3 Claims



1. A method of working the surface of a hemispherical shell having a center of curvature and a central axis of symmetry passing through the center of curvature, with at least one surface projection having a selected configuration and being spaced from said central axis, said surface of said hemispherical shell having rotationally symmetrical portions lying on a side of said projection adjacent said central axis and on a side of said projection spaced away from said central axis, comprising:

rotating said hemispherical shell about said central axis;

working said rotationally symmetrical portions of said surface to render said rotationally symmetrical portions spherical;

said hemispherical shell having an intermediate surface portion lying on said surface of said hemispherical shell at a location spaced from said central axis an equal amount as said at least one surface projection;

holding said hemisperical shell fixed and, with said hemispherical shell fixed, moving a working tool over the surface configuration of said at least one surface projection for working said surface projection;

providing a cylindrical model ring which is fixed with respect to said hemispherical shell and which has a proximity switch activating area having a selected configuration which corresponds to an image projection of the selected configuration of said at least one surface projection;

providing a contactless proximity switch which is operatively connected to a working tool for retracting the working tool away from the surface of the atmospherical shell when the contactless proximity switch passes said proximity switch activating area;

working said intermediate portion of said hemispherical shell while said hemispherical shell is rotated about its central axis using said working tool in engagement with said intermediate surface portion, said contactless proximity switch moving around said cylindrical model ring with rotation of said hemispherical shell;

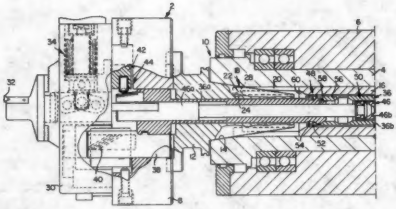
retracting said working tool away from said surface of said hemispherical shell when said at least one surface projection passes as said hemispherical shell rotates; by a sufficient amount to avoid contact between said working tool and said surface projection, retracting of said working tool taking place by the passage of said proximity switch over said proximity switch activating area; and

moving said working tool back into engagement with said intermediate surface portion after said at least one surface projection passes, movement of said working tool taking place after said proximity switch passes aid proximity switch activating area.

4,617,846
INTERCHANGEABLE TOOL HEAD FOR A NC MACHINE

Wilfried Horsch, Obrigheim, Fed. Rep. of Germany, assignor to GTE Valeron Corporation, Troy, Mich.

Filed Feb. 19, 1985, Ser. No. 703,068
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1984, 3406490
Int. Cl.[4] B23B *41/04*
U.S. Cl. 82—1.2 7 Claims



1. A tool head for a rotating of a nc machine, comprising a surface slide serving as a tool holder, which surface slide is mounted in the tool head and is displaceable in a radial direction with respect to the spindle axis by means of an axially displaceable separable control rod concentrically disposed in the work spindle, and a clamping device for clamping the tool head to the work spindle of the nc machine, the improvement wherein said tool head includes a clamping device having a cone shaped end adapted to be inserted in a matingly shaped conical bore of the work spindle whereby said tool head is adapted to be interchangeable with respect to said work spindle, said work spindle having an axially displaceable tie rod disposed therein and concentrically surround the control rod, a releasable clutch operably associated with the separable control rod comprises ball locking means adapted to be released and locked by axial relative movements between said tie rod and said control rod and adapted to be moved into and out of engagement by axial relative movements whereby said clamping device is automatically releasable and the control is automatically separable by said releasable clutch to interchange the tool head, said control rod being operatively connected to said surface slide by inclined teeth, a stop member is adjustable in a radial direction by a second separable control rod which is disposed within said first control rod and automatically separable by a second releasable clutch.

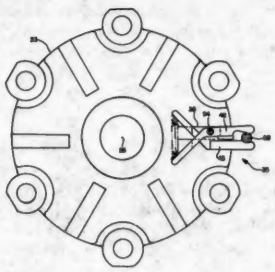
4,617,847
BAR PULLER

Kurt Schaldach, 5826 Kings Hwy., Parma Heights, Ohio 44130

Filed Dec. 10, 1984, Ser. No. 679,692
Int. Cl.[4] B23B *13/12*
U.S. Cl. 82—2.5 7 Claims

1. A bar puller for use on a chuck type bar stock machine which has a rotatable, multi tool position turret capable of moving in directions parallel to and laterally relative to the axis of the chuck or bar stock being handled by the machine including in combination a mounting block adapted to be fixedly secured in a given tool position of the turret, first and second jaw members each having first and second end portions and an intermediate portion, said first end portions of said jaw members extending generally parallel and coextensively and having facing surfaces upon which are formed stock engaging surfaces, pivot means pivotally connecting said first and second jaw members at said intermediate portions to said mounting block, to enable said first and second jaw members to move between open and closed positions, said jaw members crossing each other at said intermediate portions and said second end portions diverging from each other as said second end portions

extend from said intermediate portions, and tension spring means extending between said second end portions of said jaw



members constantly urging said jaw members to closed positions.

4,617,848

TURRET HEAD FOR A LATHE AND A TOOL HOLDER SUITABLE FOR USE THEREWITH

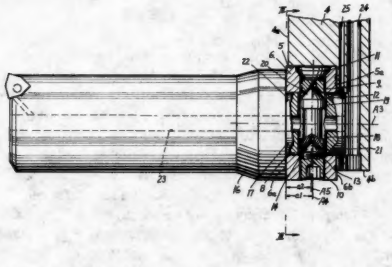
Otto Eckle, Loechgau, and Helmut Veigel, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Komet Stahlhalter- und Werkzeugfabrik Robert Bruning, GmbH, Besigheim, Fed. Rep. of Germany

Filed Aug. 20, 1985, Ser. No. 767,461

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1984, 8427440[U]

Int. Cl.⁴ B23B *29/24*

U.S. Cl. 82—36 A **7 Claims**



1. In a turret head for a lathe and a tool holder for use therewith, including a substantially cylindrical rotary disk which is rotatable about its axis and has a plurality of tool holder shank-receiving bores formed close to its periphery, these shank-receiving bores being circumferentially spaced apart and extending parallel to the axis of the rotary disk and each of them being surrounded by an end surface disposed at right angles to the axis of the rotary disk and having an associated clamping element which extends into it and is movable radially with respect to the axis of the rotary disk, and also including tool holders each having a cylindrical shank which fits accurately in the shank-receiving bore, a concentric annular surface of the tool holder surrounding each shank and extending at right angles to the axis of the same, and clamping means on the shank cooperating with the clamping element in such a manner that the annular surface of the tool holder can be pressed against the end surface surrounding the corresponding shank-receiving bore when the clamping element is moved radially, the improvement comprising wherein the rotary disk (4) has a cylindrical insert-receiving recess (5) disposed concentrically with each shank-receiving bore (8), wherein for each insert-receiving recess (5) there is provided an insert disk (6) which is removably insertable therein and concentrically within which is located the respective shank-receiving bore (8), wherein each insert disk (6) has in the region of the shank-receiving bore (8) two diametrically opposite, radially extending screw-threaded bores (9, 10), an inner clamping screw (11) with a conical recess (12) being screwed into one of the screw-threaded bores (9) which is located more inwardly in relation to the axis (A2) of the rotary disk (4) and an outer clamping screw (13) with a conical end part (14) being screwed into the other screw-threaded bore (10) which is located more outwardly in relation to the said axis, wherein the shank (17) of each tool holder has a transverse bore (18) with a clamping bolt (19) arranged for radial sliding movement therein and provided at one of its ends with a conical end part (20) which cooperates with the conical recess (12) in the inner clamping screw (11) and is provided at its other end with a conical recess (21) which is arranged to cooperate with the conical end part (14) of the outer clamping screw (13) and wherein the distance (a1) of the axis (A4) of the screw-threaded bores (9, 10) from the end surface (6*a*) of the insert disk (6) is somewhat greater than the distance (a2) of the axis (A5) of the transverse bore (18) from the annular surface (22), so that, when the outer clamping screw (13) is tightened, it acts against the clamping bolt (19) in a direction to cause pressure of the annular surface (22) and the end surface (6*a*) of the insert disk against each other.

4,617,849

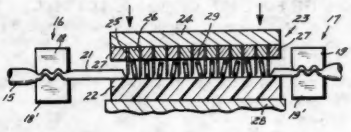
WASHER CUTTING PROCEDURE

James T. Ligon, 800 S. Main, Almont, Mich. 48003

Filed Jun. 22, 1984, Ser. No. 623,170

Int. Cl.⁴ B26D *7/14*

U.S. Cl. 83—18 **6 Claims**



3. A process for manufacture of high precision annular washers from elastomeric tubing comprising the steps of:

holding a piece of elastomeric tubing at one end against longitudinal stressing;

pulling said tubing to elongate said tubing in the direction of its longitudinal axis; and

cutting said tubing to form annular segments by means of plural spaced-apart blades by a relative movement of said blades transversely through the longitudinal axis of said tube and thereby separating and shrinking said annular segments thus severed to their non-stressed thickness condition as annular washers.

4,617,850

MACHINE FOR THE TREATMENT WEB MATERIAL

Thomas D. Bishop, Knowle, England, assignor to DEC (Realisations) Limited, Birmingham, England

Division of Ser. No. 190,521, Mar. 17, 1980, Pat. No. 4,360,354. This application Aug. 2, 1982, Ser. No. 404,526

Claims priority, application United Kingdom, Jul. 17, 1978, 30101/78; Jul. 18, 1978, 30251/78

The portion of the term of this patent subsequent to Nov. 23, 1999, has been disclaimed.

Int. Cl.⁴ B31B *1/16*

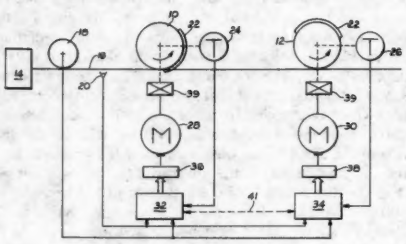
U.S. Cl. 83—324 **3 Claims**

1. A machine for treating continuous web to produce a series of longitudinally successive blanks, comprising at least two sets of treatment rolls each including a forme-carrying roll for cooperation with the web, and means for feeding the web at a

substantially constant speed successively through the nips of said roll sets, wherein the improvement comprises:

(a) a variable speed electrical motor connected to drive each forme-carrying roll through a constant speed transmission,

(b) sensor means associated with each forme-carrying roll for providing electrical signals representing the instantaneous roll speed and the location of a datum position on the roll, and



(c) a programmable computer, responsive to said electrical signals from said sensor means, which controls the speed of each variable speed electrical motor to drive the connected forme-carrying roll at a constant speed while the forme engages the web and at a programmed varying speed during the remainder of each revolution of the roll to maintain close spacing of the successive blanks produced by the forme-carrying rolls.

4,617,851

HYBRID ELECTRONIC MUSICAL INSTRUMENT

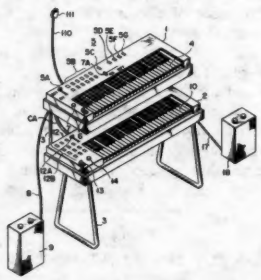
Kunio Sato, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1984, Ser. No. 605,688

Claims priority, application Japan, May 10, 1983, 58-80046; May 10, 1983, 58-80047; Jun. 3, 1983, 58-98036; Jun. 3, 1983, 58-83842[U]

Int. Cl.[4] G10H *1/02, 7/00*

U.S. Cl. 84—1.19 **9 Claims**



1. A hybrid electronic musical instrument comprising:

a plurality of electronic musical instruments;

means for connecting together said plurality of electronic musical instruments; and

control means for making the tuning states of at least two of said connected-together electronic musical instruments different from each other;

said control means being included in at least one of said connected-together electronic musical instruments; and

said control means including means for controlling a tuning setting operation for setting the tuning frequency of each of said connected-together electronic musical instruments, said tuning setting operation being executed such that the tuning frequencies of at least two of said connected-together electronic musical instruments are different from each other;

said control means further including means for setting said tuning states in response to the operation of a particular switch including a power source connection switch.

4,617,852

MILITARY EQUIPMENT COMPRISING A TURRET HAVING A MAIN EXTERNAL WEAPON

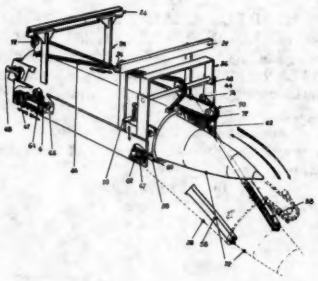
Jean-Philippe P. B. Allais, Le Havre, and Francis J. M. G. Trémouilles, Merignac, both of France, assignors to Hispano-Suiza, Saint-Cloud, France

Filed May 8, 1984, Ser. No. 608,488

Claims priority, application France, May 9, 1983, 83 08013

Int. Cl.[4] F41F *9/06, 21/14;* **F41H** *5/20*

U.S. Cl. 89—36.13 **13 Claims**



1. Military equipment comprising: a turret mounted on a mount for rotation about a substantially vertical axis; a pair of side members secured to said turret and projecting upwardly therefrom; bearing means carried by said side members and defining an elevation axis transverse to said vertical axis; a main gun of a caliber greater than that suitable for belt feed of ammunition and located out of and above said turret, carried by said bearing means and provided with a separate shield fast with said gun, said bearing means cooperating with the shield of the gun to define a protected passage; and a gun loading system, at least a portion of which is located in said protected passage, arranged to carry one round of ammunition at a time from a predetermined location and to insert said round into a firing chamber of said gun, said loading system being arranged to accomodate the variations in elevation, wherein said gun loading system constitutes a unitary assembly located within said separate shield and comprises a frame constructed and arranged to be secured to said separate shield, a slideway carried by said frame, a carriage supporting a craddle arranged to receive one round of ammunition at a time and slidably received on said slideway for movement between an axial position where said craddle supported by the carriage is aligned with said gun and a position lateral to said gun, means for moving said craddle parallel to said gun between a rear position for transport by the carriage and a front position accessible from inside the turret for placing one round of ammunition therein, and wherein said means for moving said craddle are arranged to subject said craddle to a swinging movement about a horizontal axis transverse to the axis of said gun when moving said craddle from said rear position where an axis of said craddle is parallel to said gun and a front position where said axis of said craddle has a forward slope, whereby placing of one round of ammunition is rendered easier.

4,617,853

AXIAL PISTON MACHINE OF THE SKEW AXIS TYPE WITH TWO INDEPENDENT WORKING STREAMS

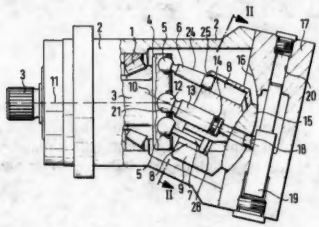
Ludwig Wagenseil, Vöhringen, and Walter Merkle, Nersingen, both of Fed. Rep. of Germany, assignors to Hydromatik, Elchingen, Fed. Rep. of Germany

Continuation of Ser. No. 652,215, Sep. 19, 1984, abandoned. This application Jan. 24, 1986, Ser. No. 823,811

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1983, 3333812

Int. Cl.[4] F01B *13/04;* F04B *1/30*

U.S. Cl. 91—505 11 Claims



1. A variable capacity axial piston machine of the skew axis type, comprising:

a housing;

a drive shaft extending into the housing and supported therein for rotation about a first axis;

a drive plate connected to the drive shaft for rotation therewith;

a cylinder drum supported in the housing for rotation about a second axis, and forming first and second groups of bores, a selected one of the groups of bores being arranged in an outer circle, the other core of the groups of bores being arranged in a concentric, inner circle;

a face valve body engaging the cylinder drum and having first control slot means to conduct a first fluid stream into and out from the first group of bores, and second control slot means to conduct a second fluid stream into and out from the second group of bores;

a first group of pistons pivotally connected to the drive plate for rotation therewith, and extending into the first group of bores;

a second group of pistons pivotally connected to the drive plate for rotation therewith, and extending into the second group of bores;

wherein the first group of pistons connect the cylinder drum to the drive plate for rotation therewith, and substantially all of the rotary force transmitted to the cylinder drum is transmitted thereto by only the first group of pistons; and

adjusting means connected to the face valve body to move the face valve body and the cylinder drum to adjust the angle between the first and second axes over a continuously variable range of angles and to thereby adjust the capacity of the machine.

4,617,854

MULTIPLE CONSUMER HYDRAULIC MECHANISMS

Walter Kropp, Aschaffenburg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

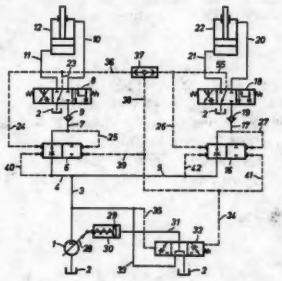
Filed Jun. 4, 1984, Ser. No. 617,113

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1983, 3321483

Int. Cl.[4] F15B *13/06, 11/20*

U.S. Cl. 91—517 3 Claims

1. In a hydraulic device with a pump and with at least two hydraulic-energy consumers acted upon by the pump, where an arbitrarily actuatable multiway control valve that throttles in the intermediate positions is located in front of each consumer and an additional hydraulically controlled valve is located in the line between the pump and this multiway control valve, the control pressure chamber of this additional valve, which loads in the closing direction, being acted upon by the pressure in front of the multiway control valve and its control pressure chamber, which loads in the opening direction, being acted upon by the pressure of the assigned consumer, the



improvement comprising said additional multiway valve having two additional control pressure chambers, of which the additional control pressure chamber loading in the closing direction is acted upon by the pressure of the consumer loaded with the highest pressure and the additional control pressure chamber loading in the opening direction is loaded with the pressure in the delivery line of the pump.

4,617,855

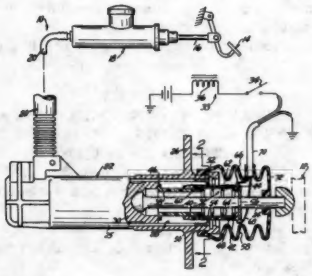
HYDRAULIC SLAVE CYLINDER SWITCH

David L. Wrobleski, Fraser; David K. Mienko, Clawson, and Keith V. Leigh-Monstevens, Troy, all of Mich., assignors to Automotive Products plc, Warwickshire, England

Filed Aug. 15, 1984, Ser. No. 641,055

Int. Cl.[4] F01B *31/12*

U.S. Cl. 92—5 R 32 Claims



1. In combination with a hydraulic cylinder having a linearly displaceable member, an electrical switch extending into said cylinder and operable by said member during displacement of said member for a home position to an operative position said electrical switch having stationary contact means and movable contact means displaceable by said member when displaced from said home position wherein said movable contact means is displaced to said operative position causing engagement of said movable contact means with said stationary contact means, and automatic adjustment means for adjusting the position of said stationary contact means by said member upon return of said member to said home position.

17. In combination with a hydraulic cylinder having a linearly displaceable member, an electrical switch into said cylin-

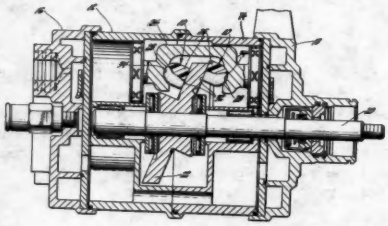
der and operable by said member during displacement of said member from a home position to an operative position, said electrical switch having stationary contact means and movable contact means displaceable by said member when displaced from said home position wherein said movable contact means is displaced to said operative position causing engagement of said movable contact means with said stationary contact means, and automatic adjustment means for adjusting the position of said stationary contact means by said member upon said member reaching said operative position.

4,617,856

SWASH PLATE COMPRESSOR HAVING INTEGRAL SHOE AND BALL

Gary T. Miller, Amherst, N.Y.; Ronald E. Marker, New Lebanon, Ohio, and Richard L. Marker, Lockport, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 13, 1986, Ser. No. 818,014
Int. Cl.[4] F04B *1/16;* F01B *3/02;* F16C *5/00*
U.S. Cl. 92—71 **2 Claims**



1. A swash plate compressor having a piston driven by a swash plate through a ball and shoe arrangement characterized by the ball and shoe arrangement comprising a plastic cylindrical body having a flat surface at one end that is slidably engaged by one side of the swash plate and further having a semi-spherical surface at an opposite end that is received under preload in a semi-spherical socket in the piston, said body being made of plastic having a coefficient of thermal expansion greater than and a coefficient of friction less than steel and brass and further having a compliance while being resistant to permanent deformation such that at assembly the pre-load forces the semi-spherical end to tightly seat in the socket.

4,617,857

SEALING ARRANGEMENT FOR A LONGITUDINALLY-SLOTTED PRESSURE CYLINDER CLOSED ON THE ENDS

Heinrich Kedzierski, Wennigsen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Steuerungstechnik GmbH, Hanover, Fed. Rep. of Germany

Filed Oct. 17, 1984, Ser. No. 661,555
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1983, 3338305
Int. Cl.[4] F01B *29/00, 11/02;* F16J *15/18*
U.S. Cl. 92—88 **16 Claims**

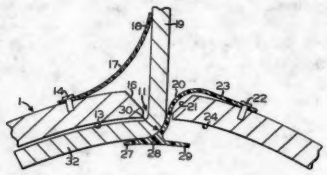
1. A fluid-pressure-operated, longitudinally-slotted pressure cylinder closed on both ends, comprising:

(a) a cylinder housing having a longitudinal slot formed along at least a portion of the length of said cylinder housing and a chamber formed within said cylinder housing;

(b) a piston member movable within said chamber under the influence of pressurized fluid;

(c) a drive member eccentrically attached to said piston, said driver member having an outer portion extending outward through said longitudinal slot and an inner portion disposed within said chamber and on which said piston attaches; and

(d) flexible sealing means disposed over said longitudinal slot for sealing said chamber and preventing pressurized fluid from escaping through said longitudinal slot as said piston and said driver member travel along said longitudinal slot, said flexible sealing means being at least partially attached



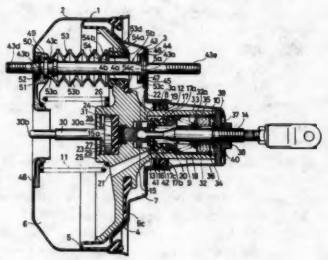
externally on said cylinder housing on one side of said longitudinal slot, said flexible sealing means having an S-shaped sealing portion extending through said longitudinal slot and a flat sealing portion which seats over a portion of said longitudinal slot and said driver member.

4,617,858

PNEUMATIC BOOSTER

Nobuaki Hachiro, Ueda, Japan, assignor to Nisshin Kogyo Kabushiki Kaisha, Japan

Filed Sep. 16, 1981, Ser. No. 302,857
Claims priority, application Japan, Sep. 26, 1980, 55-134046
Int. Cl.[4] F01B *19/00*
U.S. Cl. 92—98 D **9 Claims**

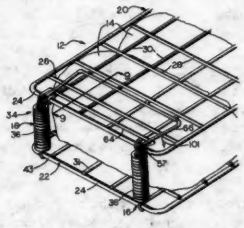


1. A servo mechanism comprising a pressure housing having a front and a rear, a piston movably mounted in the housing, a diaphragm co-operating with the piston and housing to define within the housing a first pressure chamber at the front of the piston and a second pressure chamber at the rear of the piston, a tie rod extending through the front of the housing, the piston, the diaphragm, and the rear of the housing, successively, and a boot in the form of a bellows surrounding the tie rod within the first chamber in a substantially fluid-tight manner, on end of the boot being secured to the front end of the tie rod, and the other end of the boot secured in position to the piston wherein said other end of the boot is secured in position by means of a cylindrical member which engages within the boot and co-operates with at least one of the piston and the diaphragm such that the passage of the tie rod through the piston and the diaphragm are kept airtight, wherein said cylindrical member has a first cylindrical portion which serves to clamp said other end of the boot between said first portion and the inner periphery of a hole in the piston, and a second radially extending end portion which engages the diaphragm around a hole therein, such that the boot and diaphragm are clamped tightly together.

4,617,859
MEAT PRODUCT PRESS APPARATUS

Albert D. Nichols, 1505 East Graber, and Raymond C. Nichols, 1201 Luther, both of Wichita, Kans. 67216

Filed Jul. 8, 1985, Ser. No. 752,533
Int. Cl.[4] A47J *43/18*
U.S. Cl. 99—351 12 Claims



1. A meat product press apparatus operable to receive, hold and compress a food product therein for a cooking and/or smoking food process, comprising

(a) a lower press assembly providing a support member extending in a generally common plane;

(b) a top press assembly providing a support assembly extending in a generally common plane;

(c) a main clamp assembly to releasably interconnect said top press assembly to said lower press assembly to clamp the meat product therebetween;

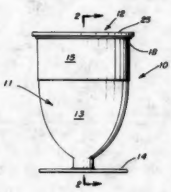
(d) said main clamp assembly including an initial bias lock assembly to connect adjacent end portions of said lower press assembly and said top press assembly and a pressure bias lock assembly to connect other adjacent ends of said lower press assembly and said top press assembly;

(e) said initial bias lock assembly includes bias members and a cam lock member operable in one position to release downward movement of said top press assembly and operable in second position to provide a downward clamping action against the meat product held between said lower and top press assemblies.

4,617,860
EGG COOKING DEVICE

Michael A. Blaylock, Rte. 1, Prim Springs, Tenn. 38476

Filed Nov. 4, 1985, Ser. No. 794,719
Int. Cl.[4] A47J *29/06*
U.S. Cl. 99—415 6 Claims



1. An egg cooking device comprising:

(a) a receptacle for receiving an egg without its shell comprising a lower cup-shaped member generally having the shape of half of an egg and an upper cylindrical skirt member having an open top,

(b) a cap member comprising a dome and a cylindrical guide wall surrounding the dome,

(c) said guide wall being slideably receivable coaxially within said skirt member in a closed position in which said dome opposes said cup-shaped member,

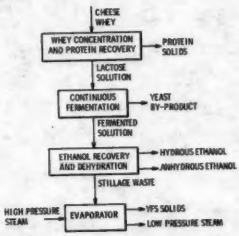
(d) a pedestal on said receptacle for supporting said receptacle in an upright position, and

(e) an air vent through said dome.

4,617,861
WHEY TREATMENT APPARATUS

Gordon M. Armstrong, Scotts Valley, Calif., assignor to Fermentation Engineering, Inc., Manteca, Calif.

Filed Oct. 7, 1982, Ser. No. 433,239
Int. Cl.[4] A23C *21/00*
U.S. Cl. 99—453 5 Claims



1. A cheese whey treating system comprising

(a) a whey protein concentrator having an outlet for removing water from whey,

(b) a whey protein precipitator communicating with the outlet of the whey protein concentrator and comprising a steam injector means for mixing the concentrated whey solution with steam, the whey protein precipitator having an outlet,

(c) a whey protein separator communicating with the outlet of the whey protein precipitator for separating precipitated protein solids from liquid, the liquid being a lactose solution, the whey protein separator having a lactose solution outlet,

(d) a fermentation means communicating with the lactose solution outlet, for converting lactose in the lactose solution to ethanol, the fermentation means having a fermented

(e) distillation means communicating with the fermented product outlet for separating ethanol from the fermented product, the distillation means having a distillate outlet and a stillage outlet,

(f) dehydrator means communicating with the distillate outlet for removing water remaining in the distillate, and

(g) evaporator means communicating with the stillage outlet for concentrating the stillage to yield a yeast with fermentation solubles concentrate.

4,617,862
PORTABLE BIN TRANSFER SYSTEM

Donald W. Van Doorn; James B. Hawkins; Francis W. Carpenter, III; Wilbur G. Hudson; Tommy W. Webb, and William D. Beeland, all of Columbus, Ga., assignors to Lummus Industries, Inc., Columbus, Ga.

Filed Oct. 17, 1985, Ser. No. 788,623
Int. Cl.[4] B30B *15/30*
U.S. Cl. 100—53 18 Claims

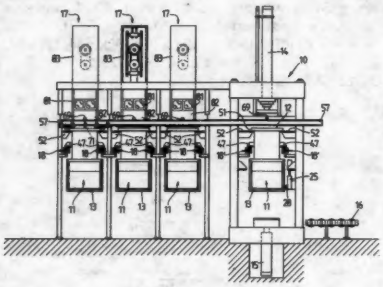
1. Apparatus for a system for compacting fibers and the like from a plurality of sources having a plurality of fiber filling stations and a single compression station located along a common center line, comprising:

(a) a plurality of portable fiber receiving bins including at least one bin for each filling station with each bin being open at the top thereof for receiving fibers;

(b) dedicated transport means for moving full bins along a first line parallel to said center line;

(c) second dedicated transport means for moving empty bins along a second line parallel to said center line with said center line being intermediate said first and second line;

(d) shuttle means located at each filling station and said compression station for moving said bins selectively to and from said first parallel line and said second parallel



line and for positioning said bins selectively within said compression station and said filling station; and

(e) control means for directing the movement of said transport and shuttle means.

4,617,863

PLATE AND DIAPHRAGM ASSEMBLY FOR A FILTER PRESS

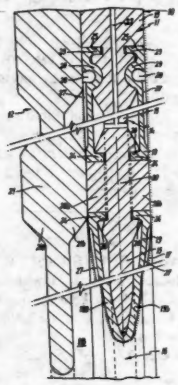
Jack Kenyon, The Well, Mill Lane, Goostrey, Cheshire, United Kingdom (CW4 8PN)

Continuation of Ser. No. 439,025, Nov. 4, 1982, abandoned. This application Mar. 28, 1984, Ser. No. 594,198

Claims priority, application United Kingdom, Nov. 7, 1981, 8133646

Int. Cl.[4] B01D *25/12*

U.S. Cl. 100—194 **15 Claims**



1. A filter plate and diaphragm assembly for use in a filter press wherein a plurality of plates are disposed in face-to-face relationship and clamped together to form a stack and a clamping force is applied by a clamping means, the stack having a plate structure which includes either a plate structure wherein all of the plates are filter plate and diaphragm assemblies arranged in registry in face-to-face relationship, or a plate structure wherein a first plurality of plates are filter plate and diaphragm assemblies and a second plurality of plates are plain plates without diaphragms, and the filter plate and diaphragm assemblies and the plain plates are arranged alternately in face-to-face relationship and in registry, said filter plate and diaphragm assembly comprising:

a filter plate having a cross section and having a major axis and a minor axis perpendicular to said major axis, the cross section of the plate having a length extending along the major axis and a thickness extending along the minor axis, said plate including a central portion having first and second side faces and which central portion, in use, is in facing relationship with an adjacent plate having first and second side faces and with a filter cake cavity defined between a pair of adjacent plates in a stack of plates, a peripheral portion surrounding said central portion and including a pair of oppositely facing sides which in use are in facing abutting relationship with a peripheral portion of a next-adjacent plate in a stack, and a feed aperture extending from said first side face to said second side face of said central portion to define a flow passage for a slurry which is to be filtered;

a resilient diaphragm which is a sheet of fluid-impervious, resilient material positioned to overlie said central portion of said filter plate between said feed aperture and said peripheral portion on at least one side face of said filter plate, said sheet having an outer periphery and an inner periphery and having an inner surface and an outer surface;

wherein said filter plate has a continuous, inwardly extending recess not extending completely through said thickness of said filter plate at a junction between said peripheral portion and said central portion, said recess having a cross section in the direction of the minor axis of said plate, and wherein said diaphragm has at said outer periphery a lip which extends laterally outwardly from the inner surface of said sheet of resilient material and which when in use extends inward toward the major axis of said filter plate and in a direction substantially parallel to the minor axis of said filter plate, said lip having a cross section corresponding to the cross section of said recess for sealing engagement therewith, said lip extending into said recess to define a continuous seal between said filter plate and said diaphragm, the seal spaced outwardly of said feed aperture in the direction of the major axis of said filter plate and surrounding said feed aperture and spaced inwardly of an outermost edge of said peripheral portion of the filter plate in the direction of the major axis of said filter plate, the outer surface of said sheet adjacent said lip spaced outwardly from said filter plate major axis a distance sufficient to abut a surface carried by a next adjacent plate of said stack; and

wherein said lip is maintained in sealing engagement with said recess when in use by a minor fraction of a plate clamping force provided by a plate clamping means, the minor fraction of the clamping force being applied to said lip by a part of a next adjacent plate of said stack, and a major fraction of the clamping force acting to clamp together adjacent plates at peripheral portions of said plates outside the outer periphery of the diaphragm.

4,617,864

CYLINDER WITH INTERNAL HEAT EXCHANGE COILS TO HANDLE CONTINUOUS WEBS

Arnold Niedermaier, Beidersheim, and Peter Maier, Worms, both of Fed. Rep. of Germany, assignors to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Sep. 10, 1985, Ser. No. 774,350

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1984, 3439090

Int. Cl.[4] B41F *5/04;* F28D *11/02*

U.S. Cl. 101—219 **11 Claims**

1. A cylinder for handling continuous lengths of web material comprising a tubular casing,

bearers at ends of such casing for supporting same rotatably,

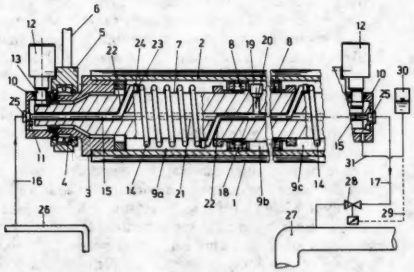
a spindle arranged to be stationary in relation to rotation of said casing and having an external diameter less than the

diameter of an inner face of said tubular casing, said spindle extending continuously through said casing from end to end thereof,

a support bearing means which is symmetrical in relation to the middle of the cylinder and coaxial to said cylinder, said bearing means bridging over an annular space existing between said casing and said spindle,

oil at least partly filling said annular space,

two to five heat exchangers placed in said annular space and surrounding said spindle, said heat exchangers being connected with each other fluidwise by means of a connection duct running through a recess in the spindle and bridging over the support bearing means,



mounts fixed to said spindle for locating said heat exchangers thereon, and

connection ducts for coolant, at least partly in the form of lengths of flexible hose placed in recesses in said spindle, said coolant connection ducts being adapted to join said heat exchangers with an external coolant supply and return duct.

4,617,865

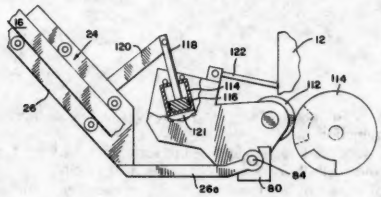
LIQUID COATER FOR A PRINTING PRESS WITH MOVEABLE INKING ROLLER AND TRAY

Thomas G. Switall, Wheeling, Ill., assignor to Ryco Graphic Manufacturing, Inc., Wheeling, Ill.

Filed Aug. 7, 1985, Ser. No. 763,274

Int. Cl.[4] B41F *31/00*

U.S. Cl. 101—350 **17 Claims**



1. In a printing press having a recessed printing press cylinder, a coater for applying a liquid coating material to the printing press cylinder, said coater comprising a frame, a tray mounted on said frame for holding a supply of coating material, roller means carried by said frame for transferring coating material from said tray to the printing press cylinder, track means attached to the printing press and extending from adjacent said printing press cylinder to a point remote from said printing press cylinder, frame moving means for moving said frame and said tray and roller means carried thereby along a first path defined by said track means into and out of position adjacent said printing press cylinder, and tray and roller moving means for moving said roller means along a second path which differs from and intersects said first path into and out of position for engagement with the printing press cylinder after said frame has been moved to its position adjacent said cylinder, whereby liquid coating material may be picked up from said tray and applied to said printing press cylinder by said roller means.

4,617,866

PYROTECHNIC OR EXPLOSIVE DEVICE

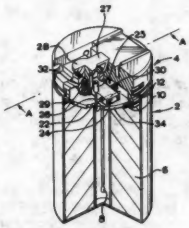
Geoffrey M. Simpson, Bulwell, United Kingdom, assignor to Haley & Weller Limited, Derbyshire, United Kingdom

Filed May 16, 1984, Ser. No. 610,706

Claims priority, application United Kingdom, May 18, 1983, 8313572; European Pat. Off., May 9, 1984, 84303116.2

Int. Cl.[4] F42C *19/06, 11/06*

U.S. Cl. 102—262 **4 Claims**



1. An explosive device including an outer casing containing an explosive charge, an electrical firing circuit and an electrical firing element connected to said electrical firing circuit and positioned to ignite said explosive charge,

an electrical energy storage battery positioned within said outer casing,

electrical switch means positioned within said outer casing for, in a first normal position, isolating said electrical energy storage battery from said electrical firing circuit and, in a second activated position, connecting said electrical energy storage battery to said electrical firing circuit,

a manually engageable operating level for controlling the position of said electrical switch means, pin means for retaining said operating lever in a first position in which said electrical switch means is maintained in its first normal position,

spring means for biasing said operating lever to move said operating lever to a second position on removal of said retaining pin means and manual release of said operating lever, in which second position the switch means is switched to its second activated position to fire said explosive charge.

4,617,867

TROLLEY BRACKET

Ingemar Arneteg, Vretstorp, Sweden, assignor to Stellana Plast AB, Sweden

Filed Nov. 9, 1984, Ser. No. 670,028

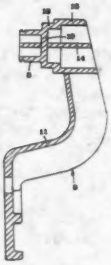
Claims priority, application Sweden, Nov. 25, 1983, 8306515

Int. Cl.[4] B61B *3/00*; A47H *13/10*

U.S. Cl. 105—154 **5 Claims**

1. A trolley bracket with at least one element which comprises a pivot for receiving a wheel movable along a guide and rotatable by means of a bearing and a member hanging down from the pivot and having means for connecting the element to an object to be supported by the bracket, wherein the pivot and the hanging member are formed as an integral piece from plastic, the pivot being in the form of a first cylindrical shell having an outer diameter which substantially corresponds to the inner diameter of the bearing of the wheel, such that the

bearing can be directly applied to the pivot, and wherein the hanging member comprises a substantially L-shaped structural wall whose outer side is provided with a plurality of longitudinal stiffening ribs which, at the top, merge into a second cylindrical shell located at the side of the structural wall opposite to the first-mentioned pivot-forming shell, said structural wall, said stiffening ribs and said two cylindrical shells having substantially the same wall thickness.

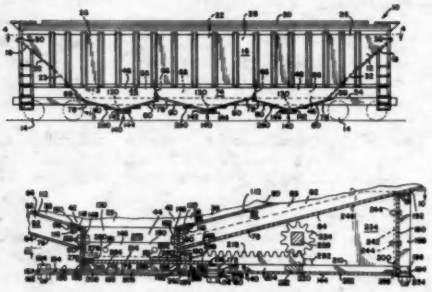


4,617,868

RAILROAD HOPPER CAR WITH SELF-CONTAINED DISCHARGE SYSTEM

Merle D. Wahlstrom, South Holland, and Brian T. Votaw, Aurora, both of Ill., assignors to Miner Enterprises, Inc., Geneva, Ill.

Filed Dec. 10, 1984, Ser. No. 680,196
Int. Cl.[4] B61D *7/20, 7/22*
U.S. Cl. 105— 3 Claims



1. A railroad hopper car having self-contained means to enhance an unloading of commodity shipped in said car with said means providing resistance to an intermingling of said commodity with outside contaminants during shipment and unloading, said means including a slide gate discharge assembly comprising:

chute portion connectable to conveyor ends in a body of said car to define in part a chute outlet, said chute portion including spaced apart side frame angles connecting with end plates, an inner and outer frame angle connecting with said end plates to pivotally hold a first sanitary plate rotatable to cover or uncover a lower end of a passageway through said chute portion and a moveable door plate carried by slide bars attached to said side and outer end frame angles to form a further selective closure of said passageway; and

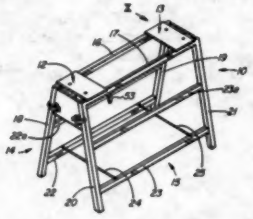
a drive portion connecting with said chute portion, said drive portion having an inner end wall plate prepared to connect with said conveyor, a pair of spaced apart slide bars attached to said end wall plate and positioned to align with said chute portion slide bars to receive said door plate upon retraction by operative means, said operative means having a rack attached to said door plate and extending into said drive portion, said door plate to be carried on a support bar attached to said slide bars whereby said rack is contained within the drive portion irrespective of the position of said door plate, a pinion gear in operative engagement with said rack with said pinion affixed to a shaft having ends journaled in side cover plates, said side cover plates connecting with said drive portion end wall plate, a handle attached to an end of said shaft exterior of said side cover plate for selective rotation of said shaft and affixed pinion to move said rack and attached door cover plate, upper, lower and side seals carried in said drive portion to continuously engage an upper and lower surface and sides of said door plate to isolate said drive portion from said chute portion whereby no commodity can seep therebetween, a drive portion sanitary plate pivotally carried by said inner end wall plate and side cover plates, said drive portion cooperates with the bottom wall of the conveyor body to form an enclosure whereby said door plate is not subject to environmental contaminants when said door plate is within said drive portion, wherein retraction of said door plate and selective positioning of said first sanitary plate opens said passageway for ready unloading of said commodity with said commodity maintained separate and apart from said assembly drive portion in part of by said seals.

4,617,869

FOLDING TABLE, WORKBENCH OR THE LIKE

Ernest A. Denomey, 390 Lalonde Street, Belle River, Ontario, Canada (M0R 1A0)

Filed Dec. 6, 1983, Ser. No. 558,483
Claims priority, application Canada, Jun. 23, 1983, 431035
Int. Cl.[4] A47B *3/00, 83/02*
U.S. Cl. 108—132 8 Claims



1. A folding table, workbench or the like comprising in combination:

(a) a bearing section adapted to form, in an unfolded state, a normally horizontal top section of the table;

(b) a pair of leg members, each leg member comprising a generally straight beam section and two leg sections, one of said leg sections being arranged at each end of the respective beam section, said leg sections being integral with and at an angle to the respective beam sections, whereby each beam section and the leg sections integral therewith form a generally U-shaped configuration;

(c) first hinge means hingedly connecting the beam section of one of said leg members to said bearing section for pivotal movement about a first hinge axis generally parallel with the beam section of said one of said leg members;

(d) second hinge means hingedly connecting the beam section of the other one of said leg members to said bearing section for pivotal movement about a second hinge axis generally parallel with the beam section of the other one of said leg members and with said first hinge axis;

(e) a pair of brace members, each of said brace members including a base portion adjacent said bearing section and two opposed side portions, each side portion defining an outwardly facing, generally planar edge section;

(f) third hinge means for connecting said brace member base portions with said bearing sections, respectively, for pivotal movement about third hinge axes disposed transversely to said first and second hinge axes and generally coplanar with said bearing section; and

(g) a pair of releasable clamping devices connected with opposite sides of each of said brace members, said clamping devices including a clamping portion engaging the outer edge of said leg sections and operable to hold said leg sections against the adjacent edge section of said brace member side portions, respectively, to rigidly secure said leg members relative to said brace members and said bearing section to improve the stability of the table in the unfolded condition.

4,617,870

METHOD OF ACCELERATING RADIATIVE TRANSFER

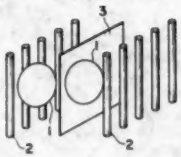
Masahiro Hirano, Tokyo, and Toshio Miyauchi, Yokohama, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 23, 1985, Ser. No. 726,094

Claims priority, application Japan, Apr. 27, 1984, 59-83965

Int. Cl.⁴ F23M *8/00*

U.S. Cl. 110—323 **12 Claims**



1. A method of accelerating radiative transfer, characterized in that a radiation acceleration plate is interposed between heat absorption pipe trains or planes disposed opposite to each other and heated by radiation of gases having a high temperature in a radiation portion of a furnace so that the pipes or planes are heated by radiation of the acceleration plate and radiation of the gases.

4,617,871

STEERABLE WIND-POWERED VEHICLE

Chi L. Yau, 64 Main Street, Frodsham, Cheshire, England

Continuation of Ser. No. 587,561, Mar. 8, 1984, abandoned. This application Sep. 12, 1985, Ser. No. 774,876

Claims priority, application United Kingdom, Mar. 8, 1983, 8306282

Int. Cl.⁴ B63H *9/00*

U.S. Cl. 114—39 **22 Claims**

1. A steerable wind-powered vehicle, which comprises:

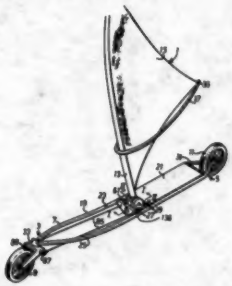
(a) an elongate base having a longitudinal axis;

(b) first and second carrier means selected from the group consisting of wheels, skis, skates and hydrofoils, said first carrier means being located at one end of said base and the second carrier means being located at the other end of said base to support said base,

wherein a point of the first carrier means and a point of the second carrier means are substantially collinear with the axis of the base, at least one of said carrier means being arranged to be steerable;

(c) a mast carrying a sail;

(d) means pivotally mounting said mast on said base; and



(e) a mechanism responsive to lateral pivotal movement of said mast relative to said base for controlling directional movement of said steerable carrier means.

4,617,872

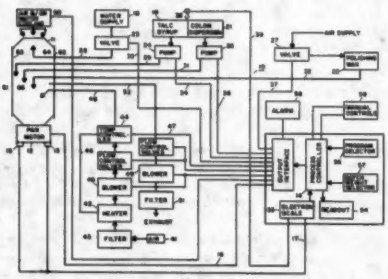
COATING PROCESS AND APPARATUS

Guido W. Melliger, 9 Great Meadow La., E. Hanover, N.J. 07936, assignor to Guido W. Melliger, E. Hanover, N.J.

Division of Ser. No. 613,962, Apr. 24, 1984, abandoned, which is a division of Ser. No. 489,044, Apr. 27, 1983, abandoned, which is a division of Ser. No. 304,100, Sep. 21, 1981, Pat. No. 4,407,844, which is a division of Ser. No. 140,469, Apr. 17, 1980, Pat. No. 4,310,562, which is a division of Ser. No. 934,519, Aug. 17, 1978, abandoned, which is a division of Ser. No. 777,468, Mar. 14, 1977, Pat. No. 4,133,290, which is a continuation-in-part of Ser. No. 672,766, Apr. 1, 1976, abandoned. This application Aug. 5, 1985, Ser. No. 762,577

Int. Cl.⁴ A23G *3/20*

U.S. Cl. 118—19 **4 Claims**



1. In an apparatus for coating solid pharmaceutical dosage forms having coating means in association with a container means which is in rotatable communication with a rotating means, the improvement which comprises means for applying a fine mist of water to the interior of the coating pan wall.

4,617,873

BIRD CAGE WITH FOLD-DOWN TOP

George C. Kelmetis, 173 Marine St., Farmingdale, N.Y. 11735

Filed May 13, 1985, Ser. No. 733,103

Int. Cl.⁴ A01K *31/08*

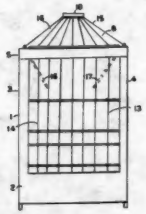
U.S. Cl. 119—17 **2 Claims**

1. A cage having a rectangular bottom member and four side members affixed to the bottom member,

four flat top members each having a truncated triangular

shape each top member being pivotally connected to said top frame, a top frame,

and means connected to the truncated triangular members to hold them in place when they are rotated up



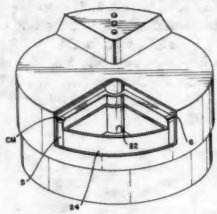
whereby the top panels can be folded down against the inside of the side panels topermit easy cleaning of the cage.

4,617,874

DEVICE FOR THE CONSERVATION AND THE TIME-DISTRIBUTION OF FOOD FOR ANIMALS

Alessandro Zammarano, Via delle Fornaci, 29, 00165 Roma, Italy

Filed Feb. 27, 1985, Ser. No. 706,217
Claims priority, application Italy, Feb. 28, 1984, 47770 A/84
Int. Cl.[4] A01K *5/02*
U.S. Cl. 119—51.12 **7 Claims**



1. A device for preserving animal food and distributing the food to an animal according to a preselected schedule, said device comprising:

a housing having an enclosed area for preserving the food therein, said housing having a feeding opening which provides an exposed area that occupies only a portion of the area within said housing and that provides access to the food;

a support member rotatably mounted in said housing, said support member carrying a plurality of open bins for containing the food and including a plurality of partitions formed of thermal insulative material;

sealing means operable between said housing and said support member, said sealing means and said thermally insulative partitions being operable to isolate the bins from each other and to isolate said enclosed area from said exposed area;

refrigerating means for regulating the temperature of said enclosed area, said refrigerating means including a compressor, and a thermostat for controlling said refrigerating means;

means for rotating said support member within said housing, said rotating means rotating said support member to move said bins into communication with the feeding opening;

means for heating a said bin located in said exposed area; and

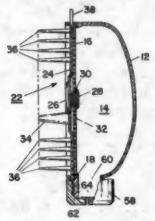
control means for controlling said rotating means, said control means including a timer for actuating said rotating means to rotate each of said bins having food into communication with said feeding opening in accordance with said preselected schedule.

4,617,875

GROOMING AND TREATMENT APPLICATOR

Linda L. Holland, 1319 Nonchalant Dr., Simi Valley, Calif. 93065

Filed Jun. 18, 1985, Ser. No. 746,183
Int. Cl.[4] A01K *13/00;* **A45D** *24/22*
U.S. Cl. 119—85 **17 Claims**



1. A versatile combined grooming and treatment applicator assembly comprising:

a circular housing for containing liquid or powder, said housing including a flat circular face with a peripheral lip and a plurality of spaced openings extending therethrough;

a plurality of applicator face plate units, each having outwardly extending means for engaging the skin or hair of a body, said face plates units having nozzles extending to the extremity of said outwardly extending means and overlying said spaced openings;

means for shutting off said nozzles and sealing said openings by rotating said face plate units;

means for removably and rotatably securing said faceplate units to said flat circular face within said lip;

means for securing a strap to said housing for extending around the back of a person's hand; and

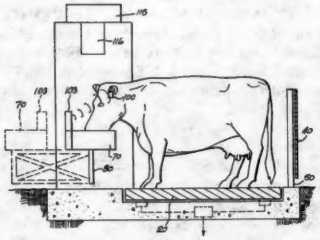
means for filling said housing with fluid or powder for application to the skin or hair of a body.

4,617,876

ANIMAL IDENTIFICATION AND CONTROL SYSTEM

Norman J. Hayes, 36 Rd. 2 ABN, Cody, Wyo. 82414

Filed Nov. 28, 1984, Ser. No. 675,991
Int. Cl.[4] A01K *29/00, 1/02*
U.S. Cl. 119—155 **32 Claims**



9. Apparatus for sorting of selected animals from a group of animals comprising:

stall means having an entrance gate and an exit gate for temporarily confining each of the animals on a one at a time basis;

means in said stall means for determining a current physical

characteristic, such as weight of the animal, of each confined animal during the temporary confinement of that animal and for generating a data signal representative of the physical characteristic;

data comparing means for receiving the data signal and for comparing the current physical characteristic of the animal with pre-established data relating to the determined current physical characteristic and for generating gate control signals; and

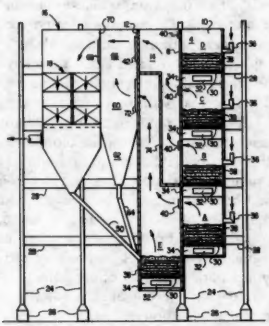
control means for receiving the gate control signals and for selectively actuating said entrance gate and said exit gate for selectively segregating the animal from the other animals by release of a selected animal from the temporary confinement in the stall means only through the exit gate in response to control signals generated by said data comparing means.

4,617,877

FLUIDIZED BED STEAM GENERATOR AND METHOD OF GENERATING STEAM WITH FLYASH RECYCLE

Robert L. Gamble, Wayne, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jul. 15, 1985, Ser. No. 754,782
Int. Cl.[4] F22B *1/00*
U.S. Cl. 122—4 D 19 Claims



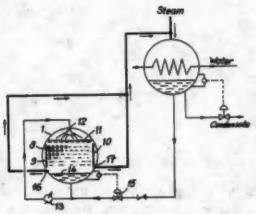
1. A steam generator comprising a furnace section, means defining a plurality of vertically spaced fluidized beds in said furnace section, one boundary wall of said furnace section having openings therein for permitting the discharge of effluent gases from said fluidized beds, means including said one boundary wall for defining a heat recovery enclosure adjacent said furnace section for receiving said effluent gases, means defining a fluidized bed in said heat recovery enclosure, housing means disposed adjacent said heat recovery enclosure for receiving the effluent gases from said heat recovery enclosure, means in said housing means for removing heat from said gases, a cyclone separator disposed in said housing, a multi-cyclone device disposed in said housing adjacent said cyclone separator, means for selectively directing said effluent gases to said cyclone separator and to said multi-cyclone device for separating the entrained solid particles from said gases and means for injecting the separated solid particles into the fluidized bed in said heat recovery enclosure.

4,617,878

PROCESS AND DEVICE FOR RECOVERY OF THERMAL ENERGY IN A STEAM GENERATING SYSTEM

André J. Paquet, Brussels, Belgium, assignor to Engetra S.A., Fribourg, Switzerland

Filed Jul. 22, 1985, Ser. No. 757,623
Claims priority, application European Pat. Off., Jan. 16, 1985, 85870007.3
Int. Cl.[4] F22D *1/40*
U.S. Cl. 122—422 18 Claims



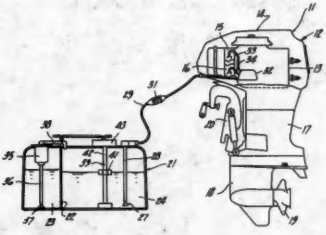
1. In a power generating system comprising (1) a water cycle in which steam expansion condensate from the expansion of steam in a turbine is recovered and heated, prior to recycling to a steam generator, with steam extracted from the steam expansion, and (2) a flue gas cycle in which flue gas from the steam generator is recycled to preheat the air used to support combustion in the steam generator, the process for recovering additional thermal energy from the flue gas cycle which comprises using the flue gas discharged from the preheater to heat the steam expansion condensate in the water cycle and extract heat from the flue gas by passing it in heat exchange with the steam heater condensate resulting from the heating of the steam expansion condensate with expansion steam, the resultant stream being recycled to said heaters to heat said steam expansion condensate.

4,617,879

FUEL AND OIL MIXTURE PRODUCING DEVICE FOR TWO-CYCLE ENGINES

Atsushi Mori, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 15, 1984, Ser. No. 660,747
Claims priority, application Japan, Oct. 24, 1983, 58-197660
Int. Cl.[4] F02B *33/04*
U.S. Cl. 123—73 AD 9 Claims



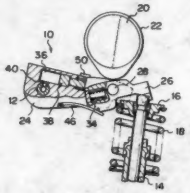
1. A fuel/lubricant supply system for a two-cycle engine or the like comprising a fuel reservoir, a lubricant reservoir, measuring means for measuring the amount of fuel supplied to said fuel reservoir, and metering means for transferring an amount of lubricant from said lubricant reservoir to said fuel reservoir in proportion to the amount of fuel added to the fuel reservoir as measured by said measuring means.

4,617,880

VALVE ACTUATING APPARATUS FOR OPTIONALLY RESTING THE OPERATION OF A VALVE IN INTERNAL COMBUSTION ENGINE

Kouji Yoshizaki, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 26, 1985, Ser. No. 780,436
Claims priority, application Japan, Dec. 25, 1984, 59-195441
Int. Cl.[4] F02D 13/06
U.S. Cl. 123—90.16 7 Claims



1. A valve actuating apparatus for optionally resting the operation of a valve in an internal combustion engine having a swing rocker arm which is pivoted at one end to a rocker arm shaft and at the other end bears against a valve stem of the valve, and a rotatable cam which bears against the rocker arm at an intermediate portion thereof to swing the latter about the rocker arm shaft, said apparatus being applied to said rocker arm which comprises:

a first arm having one end pivoted to said rocker arm shaft and the other end extending toward said valve stem;

a second arm having one end bearing against a valve stem and the other end extending toward said rocker arm shaft;

a connecting pin carried by said two arms and extending in parallel to said rocker arm shaft for rotatably interconnecting the respective other ends of said two arms;

a locking pin carried by one of said two arms and engageable with the other of said two arms to selectively interconnect said two arms, whereby said two arms are brought into a generally straight integral swing rocker arm position to operate the valve by following the cam when said locking pin interconnects said two arms, and said two arms are foldable at said connecting pin by following the cam to rest the operation of the valve when said locking pin releases said two arms; and

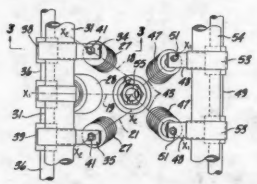
a stopper means to restrict the returning position of said two arms when folded toward the cam.

4,617,881

ACTUATING MECHANISM FOR MULTIPLE VALVE INTERNAL COMBUSTION ENGINE

Kazuo Aoi, Hamamatsu, and Naoki Tsuchida, Iwata, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 29, 1985, Ser. No. 717,832
Int. Cl.[4] F01L 1/26
U.S. Cl. 123—90.27 15 Claims



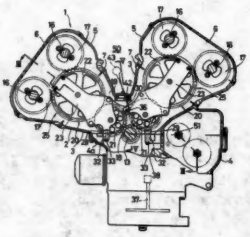
1. A valve train for an internal combustion engine having a cylinder bore having a bore axis, a first poppet valve supported for reciprocation along a valve axis defined by its stem, a second poppet valve supported for reciprocation about a valve axis defined by its stem, a camshaft supported for rotation about a rotational axis intersected by said first poppet valve stem axis and extending parallel to a plane containing said bore axis, cam means on said camshaft for opening directly said first valve, a rocker arm supported for pivotal movement, cam means on said camshaft for pivoting said rocker arm, and means on said rocker arm operative to actuate said second valve upon pivotal movement of said rocker arm, said valve axes lying on the same side of said plane as said rotational axis.

4,617,882

APPARATUS FOR DRIVING CAMSHAFTS IN AN INTERNAL COMBUSTION ENGINE

Yutaka Matsumoto, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1984, Ser. No. 587,787
Claims priority, application Japan, Mar. 11, 1983, 58-39128
Int. Cl.[4] F01L 1/02
U.S. Cl. 123—90.31 7 Claims



1. A camshaft driving apparatus for a multicylinder internal combustion engine, comprising at least one cam gear mounted on at least one camshaft rotatably supported by an engine body, a timing gear mounted on a crankshaft rotatably supported by said engine body, and a gear train having at least two intermediate gears cooperatively engaged for cooperatively engine said timing gear with said cam gear therethrough, said at least two intermediate gears being rotatably mounted to holding means to thereby form an independent unit before mounting the intermediate gears to said engine body, and said independent unit being fixedly mounted to said engine body by clamping said holding means to said engine body by bolts and other clamping members wherein said independent unit is mounted to said engine body so as to be detachable therefrom and said engine body includes an opening provided between adjacent cylinders of sufficient dimensions to allow said independent unit to pass therethrough so that it can be fixedly mounted to said engine body.

4,617,883

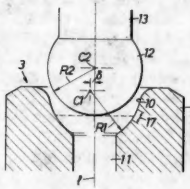
PIVOT MEMBERS FOR A CAM FOLLOWER OF VALVE MECHANISM FOR INTERNAL COMBUSTION ENGINE

Takahiro Okuyama, Tokyo; Susumu Toki, Kawagoe, and Masahito Ishihara, Kani, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Toyko and Tokai TRW & Co., Ltd., Kasugai, both of, Japan

Filed Sep. 27, 1985, Ser. No. 780,771
Claims priority, application Japan, Sep. 28, 1984, 59-203737
Int. Cl.[4] F01L 1/46
U.S. Cl. 123—90.44 4 Claims

1. In a valve mechanism for an internal combustion engine of the type in which a semi-spherical recess is formed on either one of a pivot member disposed on an engine main body and a base end of a cam follower interposed between a cam and a valve of the engine and a spherical fitting portion to fit to said semi-spherical recess is disposed at the other of said pivot member and the base end of said cam follower, the improve-

ment wherein a curved surface of said semi-spherical recess is defined such that a center of curvature of said semi-spherical recess in a longitudinal section including a center line of said



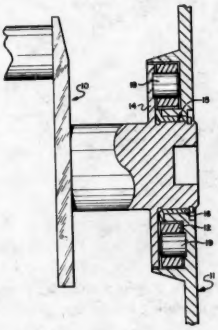
semi-spherical recess deviates from said center line, and a radius of curvature of said recess is greater than a radius of curvature of said spherical fitting portion.

4,617,884

TORSIONAL VIBRATION ISOLATOR AND METHOD

Charles A. Allen, Rte. 4, Box 332 G, Shelby, N.C. 28150, and Van D. Durrett, Shelby, N.C., assignors to Charles A. Allen, Spartanburg, S.C.

Filed Jul. 27, 1984, Ser. No. 635,044
Int. Cl.[4] F16D *3/78*
U.S. Cl. 123—192 R **6 Claims**



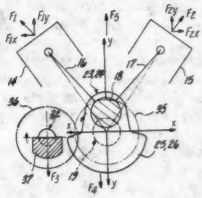
1. In a multicylinder internal combustion engine having a rotatable crankshaft and a rotatable flywheel which together define an inertial system rotating about a predetermined axis of rotation, an improvement which facilitates avoiding destructive effects on the crankshaft of stress induced by torsional vibration and comprising an elastomeric annulus coupling means operatively interposed between the crankshaft and flywheel for coupling the crankshaft and flywheel together for rotation of the flywheel with the crankshaft, said coupling means having a torsional spring rate of less than 20,000 in-lb/radian effective to permit substantial angular displacement between the flywheel and the crankshaft for isolating the rotating inertia of the flywheel from the rotating inertia of the crankshaft after engine startup for purposes of avoiding dampening while preventing torsional vibration from being transferred between the flywheel and the crankshaft.

4,617,885

BALANCER DEVICE FOR INTERNAL COMBUSTION ENGINES

Nobuaki Oshiro, Hamamatsu, and Yorio Futakuchi, Shizuoka, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed May 27, 1982, Ser. No. 382,428
Claims priority, application Japan, May 29, 1981, 56-82982
Int. Cl.[4] F02B *75/06*
U.S. Cl. 123—192 B **6 Claims**



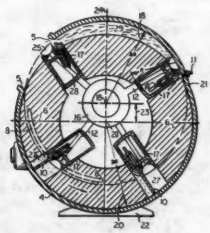
1. In an internal combustion engine having at least two cylinders arranged in the shape of a "V" at an included angle other than 90°, pistons in said cylinders, a crankshaft supported for rotation, and connecting rods connecting each of said pistons with said crankshaft, said connecting rods being offset in the axial direction of said crankshaft, the improvement comprising a balancer device comprising only one shaft member supported for rotation about an axis parallel to the axis of rotation of said crankshaft, means for driving said shaft member at the same speed as said crankshaft but in the opposite direction; a first weight on said shaft member for balancing at least a portion of the force of first order which is generated by the reciprocal movements of said pistons; and further weights formed on said shaft member for eliminating the force couple generated from the axial offset of said connecting rods.

4,617,886

ROTARY ENGINE

Stanley R. Mach, 1201 NW. 87th Way, Pembroke Pines, Fla. 33024

Filed Feb. 19, 1985, Ser. No. 703,138
Int. Cl.[4] F02B *53/00*
U.S. Cl. 123—223 **1 Claim**



1. In a rotary combustion engine having

(i) a circular rotor disposed within a rotor chamber of a rotary engine housing, said rotor chamber formed of two sections of overlapping circles having different radii and centers, one of said circular sections having essentially the same radius and center as that of the rotor and the other of said circular sections having a center axis which is offset from the center axis of the rotor,

(ii) a plurality of reciprocating pistons radially positioned

within cylinders which extend from the periphery of the surface of the rotor, and

(iii) a plurality of connecting rods each of which being connected to a piston on one end thereof and to a crank shaft of the engine on the other end thereof, the crankshaft being concentric with other of said circular sections, the improvement comprising: a rotor having plurality combustion chambers which

radially extend from the surface of the rotor inward toward said centrally located crank shaft, each of said combustion chambers being at least partially divided by a portion of the rotor which extends inward from the rotor surface into the combustion chamber, thereby partially partitioning the combustion chamber into a forward compartment and a rearward compartment;

a plurality of pistons adapted for reciprocal motion within said combustion chambers, each of said pistons being further adapted for reciprocal movement within both the forward and rearward compartments of the combustion chamber and provided with means for cooperative engagement to a connecting rod; and

a plurality of connecting rods, each of which being adapted for engaging said pistons and thereby providing reciprocal movement thereof within the combustion chamber, each of said connecting rods extending from its point of engagement of the piston, through the top of the piston and into the forward compartment of the combustion chamber, the portion of said connecting rod extending above the top of the piston being adapted to sealingly engage the surface of the other of said circular sections of said rotor chamber so as to form a gas tight seal therebetween prior to ignition of an air fuel mixture in the rearward compartment of the combustion chamber.

4,617,887

PISTON FOR INTERNAL COMBUSTION ENGINE

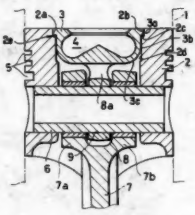
Hidenobu Nagase, Wako, and Atsushi Umemoto, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1985, Ser. No. 718,050

Claims priority, application Japan, Mar. 31, 1984, 59-63995

Int. Cl.⁴ F02F *3/26*

U.S. Cl. 123—279 **1 Claim**



1. A piston for an internal combustion engine comprising:

(a) a piston main body made of a first material and having an opening in a top surface thereof, said opening having an upper large diameter portion and a lower small diameter portion with a shoulder defined therebetween;

(b) a cavity forming member having a combustion chamber cavity formed in a top surface thereof and being made of a second material having a different thermal expansion coefficient than said first material, the diameter of said cavity forming member being less than the diameter of said piston main body, said cavity forming member being mounted in said opening of said piston main body; said cavity forming member including a flange at a top portion thereof having an outer circumferential surface in slidable contact with an inner circumferential surface of said large diameter opening portion, a tubular casing having an outer circumferential surface in slidable contact with an inner circumferential surface of said small diameter opening portion only along a portion positioned above a bottom surface of said cavity, a lower surface of said flange and an upper surface of said shoulder defining a gap therebetween, a bottom wall portion located below said outer circumferential surface of said tubular casing, said bottom wall portion being free from contact with said piston main body, a top surface in alignment with said top surface of said piston main body, and a leg portion extending from said bottom wall portion and having an opening therein;

(c) a connecting rod including coupling means having two diverging portions, each portion having an opening therein, a part of said leg portion of said cavity forming member being positioned between said two diverging portions of said connecting rod; and

(d) a piston pin mounted in said piston main body and extending through said openings in said two diverging portions of said connecting rod and said opening in said leg portion of said cavity forming member.

4,617,888

PISTONS FOR INTERNAL COMBUSTION ENGINES

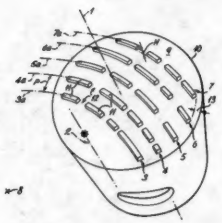
John C. Dent, Loughborough, England, assignor to National Research Development Corporation, London, England

Filed Dec. 19, 1984, Ser. No. 883,510

Claims priority, application United Kingdom, Dec. 21, 1983, 8334101

Int. Cl.⁴ F02F *3/24*

U.S. Cl. 123—307 **13 Claims**



1. A piston for use in a cylinder of an internal combustion engine of the class including those engines in which a flame is originated at a point by spark ignition and those in which it is originated by compression ignition, said piston having a piston crown surface and presenting a piston axis along which it is arranged to execute reciprocatory movement, and said cylinder presenting an ignition axis including an imaginary line parallel to said piston axis and passing through the point of said origin of said flame, and comprising:

a piston crown containing said piston crown surface;

a succession of concentric arcuately-aligned obstacles of increasing radius, formed on said piston crown to promote turbulence in an unburned charge as said flame meets the obstacles in succession as it spreads from its point of said origin, each said arcuately-aligned obstacle being radially spaced from one another and in the form of a structure standing proud of said piston crown;

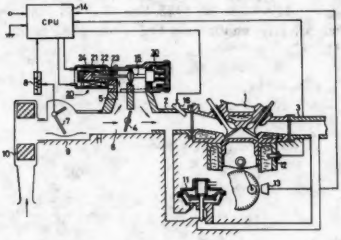
each said structure being interrupted along an arc having a single radius of curvature by which it is aligned, so as to present alternate solid elements and gaps.

4,617,889

IDLE SPEED CONTROL DEVICE

Torazo Nishimiya, Mito; Tomoo Ito, Katsuta, and Takashi Iseyama, Minori, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 10, 1985, Ser. No. 721,767
Claims priority, application Japan, Apr. 11, 1984, 59-70872; Sep. 4, 1984, 59-186161
Int. Cl.[4] F02M *3/00*
U.S. Cl. 123—339 8 Claims



1. An idle speed control device comprising:
an electromagnetic driving portion having a coil, and a core and a plunger disposed in the coil, said electromagnetic driving portion being adapted to convert an electric input supplied thereto into a mechanical output, the electric input having been delivered to the coil from a processing unit which is designed to perform necessary computation upon receipt of signals from at least a water temperature sensor and a crank angle sensor; and
a flow rate controlling portion disposed in a bypass passage formed in a throttle chamber to bypass a throttle valve, said flow rate controlling portion including a body defining a passage for the fluid to be controlled, a seat formed in an intermediate portion of the passage, a first valve for metering driven by the plunger of said electromagnetic driving portion through a rod to be brought into and out of contact with the seat, a sleeve disposed in the body, and a second valve for compensating connected through a rod to the downstream side of said first valve to produce a vacuum force which acts in the opposite direction to the vacuum force produced on said first valve thereby to absorb any fluctuation in the intake pressure in cooperation with said first valve, said second valve configured to produce a pressure differential force different from a pressure differential force produced by said first valve, wherein an outer peripheral surface of said second valve is a straight cylindrical portion, an inner peripheral surface of said sleeve is a straight cylindrical portion, said second valve is received in said sleeve to form a predetermined clearance between the outer peripheral surface of said sleeve and the inner peripheral surface of said second valve, and said predetermined clearance serves only to transmit the pressure and not allow the fluid to flow therethrough.

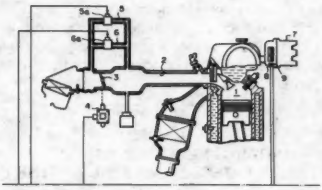
4,617,890

APPARATUS FOR CONTROLLING IDLING SPEED IN INTERNAL COMBUSTION ENGINE HAVING TWO BYPASS AIR PASSAGES

Nobuyuki Kobayashi, and Toshimitsu Ito, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 26, 1985, Ser. No. 749,089
Claims priority, application Japan, Jun. 26, 1984, 59-129976
Int. Cl.[4] F02D *41/16;* F02M *23/06*
U.S. Cl. 123—339 8 Claims

1. An apparatus for controlling the idling speed in an internal combustion engine, comprising:
an intake air passage;
a throttle valve, positioned within said intake air passage, for adjusting the amount of intake air flowing through said intake air passage;
first and second bypass air passages, linked to said intake air passage at points upstream and downstream of said throttle valve, thus bypassing said throttle valve;
a first means for determining whether or not the engine speed is larger than a first value;
a second means for determining whether or not the engine speed is smaller than a second value, said second value being smaller than said first value;
means for closing said first bypass air passage when the engine speed is larger than said first value;



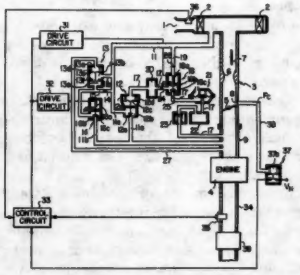
means for opening said first bypass air passage when the engine speed is smaller than said second value;
means for determining whether an electrical load is in an ON state or in an OFF state;
means for opening and closing said second bypass air passage in accordance with the determination of whether said electrical load is in the ON and OFF state, respectively;
a timer means for measuring a predetermined time period after said electrical load is changed from the ON state to the OFF state;
means for inhibiting the operation of said bypass air passage closing means when said electrical load is in the ON state, or when said timer means measures said predetermined time period.

4,617,891

SECONDARY AIR SUPPLY FOR INTERNAL COMBUSTION ENGINE

Eiji Kishida, Tokyo, and Shumpei Hasegawa, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 647,113
Claims priority, application Japan, Sep. 3, 1983, 58-162443
Int. Cl.[4] F02M *23/04*
U.S. Cl. 123—344 7 Claims



1. A secondary air intake system for an internal combustion

engine having a primary air intake with a throttle valve and an exhaust system comprising: means for determining an air-fuel ratio of the engine, first and second secondary air passages communicating with the downstream of the throttle valve of a carburetor; a first vacuum operated air control valve positioned in said first secondary air passage for changing the effective area of said first secondary air passage in accordance with the vacuum in a first vacuum receiving chamber; an electrically operated air control valve positioned in said second secondary air passage for opening and closing said second secondary air passage in accordance with said determined air-fuel ratio; a second vacuum operated air control valve positioned in said second secondary air passage for changing the effective area of said second secondary air passage in accordance with the vacuum in a second vacuum receiving chamber communicating with the downstream of said throttle valve; and vacuum control means for applying a control vacuum to said first vacuum receiving chamber so that the effective area of said first secondary air passage may be gradually increased or decreased in accordance with said determined air-fuel ratio.

4,617,892

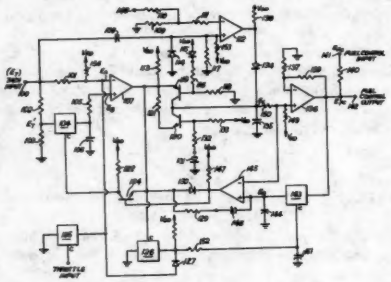
FUEL-OPTIMIZING ELECTRONIC CONTROL CIRCUIT FOR A FUEL-INJECTED MARINE ENGINE OR THE LIKE

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 622,386, Jun. 20, 1984, abandoned, which is a continuation of Ser. No. 327,166, Dec. 2, 1981, abandoned. This application Nov. 29, 1984, Ser. No. 676,217

Int. Cl.[4] G05D *13/62*; F02D *41/00*

U.S. Cl. 123—352 **10 Claims**



1. A fuel control system for providing maximum fuel economy over a wide range of engine throttle conditions of an internal combustion marine engine, comprising:

storage means for storing a fuel control signal whose magnitude is related to the operating r.p.m. of the internal combustion engine;

means for reducing the magnitude of said stored fuel control signal in response to achieving a steady state of the operating r.p.m. of the internal combustion engine;

fuel control means for controlling fuel flow to the internal combustion engine in response to the instantaneous reducing magnitude of said stored fuel control signal whereby the fuel/air ratio of the internal combustion engine is reduced as the magnitude of said stored fuel control signal is reduced;

first comparative means for comparing a steady state r.p.m.-representative signal representing said steady state operating r.p.m. of the internal combustion engine with an actual operating r.p.m. signal representing the reducing actual operating r.p.m. of the internal combustion engine; and

means responsive to said first comparative means for causing an increase in said magnitude of said stored fuel control signal in said storage means when said actual operating-r.p.m. signal falls below said steady state r.p.m. signal by a predetermined amount.

4,617,893

SPEED LIMITING SYSTEM FOR A MOTOR VEHICLE INCLUDING A SWITCH AND A METHOD FOR POSITIONING THE SWITCH

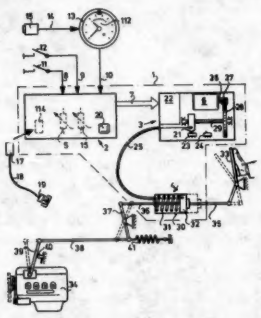
Bernd Donner, Uhldingen-Mühlhofen; Hartmut Schultze, and Lutz Jähnig, both of Villingen-Schwenningen, all of Fed. Rep. of Germany, assignors to Mannesmann Kienzle GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Jul. 24, 1985, Ser. No. 758,498

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1984, 3427329

Int. Cl.[4] E02D *41/14*

U.S. Cl. 123—361 **7 Claims**



1. A method for positioning a switch of a speed limiting device in a vehicle; wherein

a vehicle includes a vehicle engine, a fuel dosing apparatus for said engine, a gas pedal, a gear connection between said gas pedal and said fuel dosing apparatus and a clutch arrangement connected in said gear connection; and wherein

said speed limiting device includes a servo motor which is switched off by said switch, a servo component through which said speed limiting device actuates said clutch arrangement, a push switch, a rate of rotation indicator and a lock for said switch;

said method comprising the steps of:

starting said vehicle engine;

depressing said gas pedal to its fully accelerating position and holding said gas pedal in said fully accelerating position while simultaneously adjusting said servo component in the sense of a throttling of said vehicle engine by means of controlling said servo motor by operation of said push switch and observing said rate of rotation indicator;

cutting off a stroke of said servo component corresponding to a predetermined lower boundary of the rate of revolution of said vehicle engine; and

releasing said lock of said switch taken along by said servo component by means of reversing the rotational direction of said servo motor.

2. A speed limiting device for a vehicle including a switch which is positioned for controlling said speed limiting device; wherein said vehicle includes a vehicle engine, a fuel dosing apparatus for said engine, a gas pedal, a gear connection between said gas pedal and said fuel dosing apparatus and a clutch arrangement connected in said gear connection; wherein said speed limiting device includes a servo motor which is switched off by said switch, a servo component through which said speed limiting device actuates said clutch arrangement, a push switch, a rate of rotation indicator and a lock for said switch, and wherein after starting of said engine and depressing said gas pedal to its fully accelerated position

and holding said gas pedal in the fully accelerating position, said servo component may be simultaneously adjusted in the sense of throttling said vehicle engine by means of controlling said servo motor by operation of said push switch while observing said rate of rotation indicator, with said servo component having a stroke which may be cut off corresponding to a predetermined lower boundary rate of rotation of said vehicle engine with release of said lock of said switch being taken along by said servo component by means of reversing the rotational direction of said servo motor, said speed limiting device further comprising a slide upon which said switch is arranged, said slide being displaceably supported parallel to a threaded spindle driven by said servo motor and carrying said servo component, said locking means being assigned to said slide, said speed limiting device further comprising a switch-over contact bank which is connected in series with said switch and is arranged on said slide such that during the positioning of said switch, said servo component acts on said slide in such a way that said switch is actuated, with a circuit of said switch being provided which is interrupted by means of said switch-over contact bank with said locking means being ineffective.

4,617,894

GOVERNOR MECHANISM COUNTERBALANCE FOR A FUEL INJECTED INTERNAL COMBUSTION ENGINE OF A VEHICLE

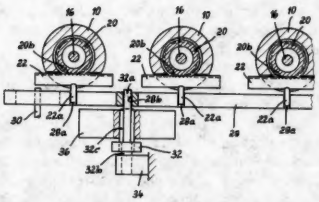
Guenter Kampichler, Ruhstorf, Fed. Rep. of Germany, assignor to Motorenfabrik Hatz GmbH & Co. KG, Ruhstorf, Fed. Rep. of Germany

Filed May 1, 1985, Ser. No. 729,380

Claims priority, application Fed. Rep. of Germany, May 3, 1984, 3416355

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—372 **10 Claims**



1. A fuel injected internal combustion engine which is capable of driving a device such as a vehicle, said engine and device being susceptible to sudden undersirable acceleration or deceleration, comprising injection pumps having fuel quantity control members which are operatively coupled to an activator which facilitates simultaneous common control thereof by an operator; wherein at least one balancing mass is positively operatively coupled to said activator, said balancing mass preventing or compensating for undersired forces which tend to move said control members and said actuator and which are produced as a result of sudden acceleration or deceleration of the device; and wherein said balancing mass includes a slidable balancing member supported for movement parallel to the direction of movement of said activator and slidable in a direction opposite to the direction of movement of said activator.

4,617,895

ANTI-KNOCKING CONTROL IN INTERNAL COMBUSTION ENGINE

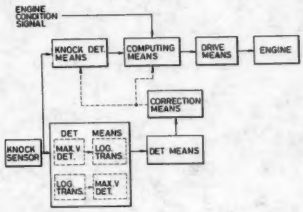
Koji Sakakibara, Hekinan; Hiroshi Haraguchi, and Hideki Yukumoto, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 17, 1985, Ser. No. 735,108

Claims priority, application Japan, May 17, 1984, 59-99898; Dec. 13, 1984, 59-264256; Mar. 4, 1985, 60-43223

Int. Cl.[4] F02P *5/15*

U.S. Cl. 123—425 **30 Claims**



1. Apparatus for controlling knocking in an internal combustion engine, comprising:

(a) a knock sensor for generating a signal in response to the vibrations in said engine;

(b) means for determining the presence of knocking by comparing said knock sensor signal with a reference;

(c) means for controlling said engine to prevent said knocking in accordance with the determination;

(d) means for measuring a maximum value of said knock sensor signal generated within a predetermined engine rotational angle at an interval thereby obtaining a plurality of maximum values;

(e) means for determining a pattern of distribution of a plurality of logarithmic values corresponding to said plurality of maximum values; and

(f) means for correcting said reference in accordance with said distribution pattern.

4,617,896

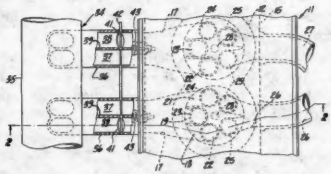
INTERNAL COMBUSTION ENGINE HAVING THREE INTAKE VALVES PER CYLINDER

Masaaki Yoshikawa, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 14, 1985, Ser. No. 711,979

Int. Cl.[4] F02B *15/00*

U.S. Cl. 123—432 **12 Claims**

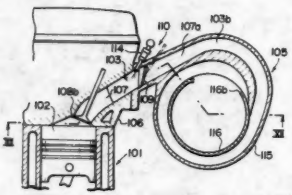


1. An internal combustion engine having a combustion chamber, a plurality of intake passages having independent portions and terminating at at least three intake ports for delivering a charge to said combustion chamber, at least three intake valves in said combustion chamber for controlling the flow through respective of said intake ports to said combustion chamber, and throttle valve means in said independent portions for controlling the flow through at least one of said intake passages independently of the flow through another of said intake passages.

4,617,897
INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINES

Junzo Sasaki; Mitsuo Hitomi, and Ueda Kazuhiko, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Jan. 22, 1985, Ser. No. 693,297
Claims priority, application Japan, Jan. 23, 1984, 59-10646; Jan. 23, 1984, 59-10647; Jan. 23, 1984, 59-10648; Jan. 30, 1984, 59-14901
Int. Cl.[4] F02B *15/00*
U.S. Cl. 123—432 27 Claims



1. An intake system for internal combustion engines comprising a first intake passage extending between a combustion chamber of an engine and a surge tank, a second intake passage extending substantially in parallel to the first intake passage and connecting the combustion chamber with the tank, said second intake passage having a relatively short effective length, cross-sectional area changing means having a valve provided in the second intake passage, said valve having a close position at which said second intake passage is substantially closed and an open position, length changing means for changing the effective length between the combustion chamber and the tank in the first intake passage thereby altering the effective length of said first intake passage to a long state and to a short state, means for operating said cross-sectional area changing means adapted to shift said valve from the close position to the open position and means for operating said length changing means adapted to alter the effective length of said first intake passage from the long state to the short state, said means for operating said cross-sectional area changing means and said means for operating said length changing means being adapted to be actuated independently of each other according to the engine speed so as to form the following three conditions at different speeda:

(i) a first condition in which said first intake passage is in the long state, said valve is at the close position, and said combustion chamber is communicated with said tank through said first intake passage in the long state;

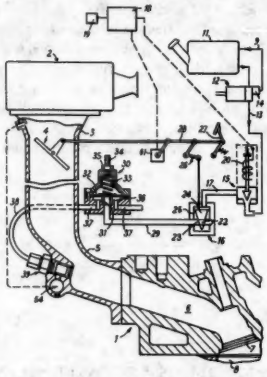
(ii) a second condition in which only one of said means for operating said cross-sectional area changing means and said means for operating said length changing means is actuated, said condition being formed during a higher engine speed operation than that of the first condition; and

(iii) a third condition in which both said means for operating said cross-sectional area changing means and said means for operating said length changing means are actuated, said first intake passage is in the short state, and said valve is at the open position, said condition being formed during a higher engine speed operation than that of the second condition; thereby changing the natural frequency of the intake system according to the engine speed to obtain an inertia supercharging effect at various engine speeds.

4,617,898
FUEL DELIVERY TO INTERNAL COMBUSTION ENGINES

Robert J. Gayler, Mersham, England, assignor to Piper FM Limited, Ashford, England

PCT No. PCT/GB82/00199, § 371 Date Mar. 3, 1983, § 102(e) Date Mar. 3, 1983, PCT Pub. No. WO83/00191, PCT Pub. Date Jan. 20, 1983
PCT Filed Jul. 7, 1982, Ser. No. 486,288
Claims priority, application United Kingdom, Jul. 7, 1981, 8120988; Sep. 8, 1981, 8127132; Oct. 29, 1981, 8132624
Int. Cl.[4] F02M *41/04*
U.S. Cl. 123—460 8 Claims



1. Apparatus for supplying fuel to an internal combustion engine, having an air intake duct for said engine, a variable air throttle valve in said duct, and at least one nozzle for delivering fuel to said intake duct, said apparatus comprising

(a) a source of fuel,

(b) means defining a flow path for fuel from said source to said nozzle,

(c) a metering valve in said flow path and having a variable constriction providing a variable flow resistance in said path,

(d) link means linking said metering valve to said throttle valve to reduce said flow resistance of said metering valve with increasing opening of said throttle valve, said link means determining a specific value of said constriction for each position of said throttle,

(e) an electrically operated on/off valve in said flow path,

(f) an accumulator in said flow path downstream of said metering valve and said on/off valve,

(g) control means for said on/off valve, said control means including a memory in which are stored values for the on time of said on/off valve in relation to predetermined values including engine speed and throttle opening,

(h) an engine tachometer connected to said control means, and

(i) a throttle opening transducer connected to said control means.

4,617,899
FUEL INJECTION CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

Tetsuo Nakajima, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1985, Ser. No. 728,979
Claims priority, application Japan, Jun. 4, 1984, 59-113094
Int. Cl.[4] F02D *41/34*
U.S. Cl. 123—487 4 Claims

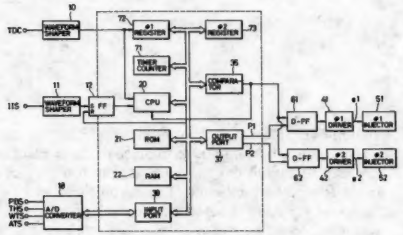
1. A fuel injection control device for an internal combustion engine, comprising means for generating a basic fuel injection

time signal based on at least one signal selected from among a signal representing the revolution number of an engine, a PB sensor signal, and a throttle signal, means for generating an actual fuel injection time signal by compensating said besic fuel injection time signal based on at least one signal selected from among an engine temperature signal and an intake air temperature signal, and means for controlling durations of keeping open the valves of injectors, provided for the separate cylinders of the internal combustion engine, based on said actual fuel injection time signal thereby controlling the amounts of fuel injected into said separate cylinders, which device is further provided with

means for detecting a top dead center signal and an injection discriminating signal,

means for computing a signal representing a revolution number of the engine based on said top dead center signal,

a timer counter for constantly taking count of clock pulses,



a register adapted to permit setting therein of a first present value produced, upon occurrence of a top dead center signal, by addition of a count value existing then in said timer counter to a value corresponding to an expected delay time and, subsequent to occurrence of an injection start signal, to permit setting therein of a second preset value produced by addition of said actual fuel injection time signal to said first preset value,

a comparator adatped to feed out an injection start signal when a count value in said timer counter is equalized with said first preset value in said register and feed out an injection stop signal when said count value in said timer counter is equalized with said second preset value in said register, and

means for selecting and designating an injector for receiving said injection start and injection stop signals based on said injection discriminating signal and said top dead center signal.

4,617,900

AIR-FUEL RATIO CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE HAVING A CONTROL CHARACTERISTIC VARYING WITH THE ENGINE LOAD

Hideo Kobayashi, Kawagoe, and Eiji Kishida, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1985, Ser. No. 699,281

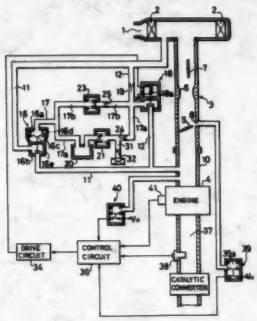
Claims priority, application Japan, Feb. 15, 1984, 59-027930

Int. Cl.[4] F02M *23/04*

U.S. Cl. 123—489 **5 Claims**

1. In an air-fuel ratio control system for an internal combustion engine, said system operates to shift the air-fuel ratio to a rich side with respect to a stoichiometric value when an engine load is high, said system including an oxygen sensor provided in an exhaust system of the engine, a comparing means for comparing a level of an output signal of said oxygen sensor with a first reference level corresponding to the stoichimetric value of the air-fuel ratio, and an air-fuel ratio control means for controlling an air-fuel ratio of a mixture to be supplied to the engine in accordance with a result of a comparison process of said comparing means, wherein the improvement comprises

a detection means for detecting a high load operation of the engine, and said comparing means comparing the level of the



output signal of the oxygen sensor with a second reference level corresponding to an air-fuel ratio value on the leaner side of said stoichimetric value.

4,617,901

AIR-FUEL RATIO FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Yutaka Otobe, and Akihiro Yamato, both of Shiki, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 684,495

Claims priority, application Japan, Dec. 23, 1983, 58-243491

Int. Cl.[4] F02M *51/00*

U.S. Cl. 123—489 **9 Claims**

1. A method of controlling the air-fuel ratio of an air-fuel mixture being supplied to an internal combustion engine equipped with an exhaust system in a feedback manner responsive to output from ingredient concentration detecting means arranged in said exhaust system for detecting the concentration of an ingredient contained in exhaust gases from said engine to produce as said output a normally fluctuating output signal indicative of the exhaust gas ingredient concentration, the method including:

comparing the value of said output signal from said ingredient concentration detecting means with a predetermined reference value,

detecting from the result of said comparison a first change in the air-fuel ratio of said mixture supplied to said engine from a value richer than a predetermined value to a value leaner than said predetermined value, and a second change in the air-fuel ratio of said mixture from a value leaner than said predetermined value to a value richer than said predetermined value,

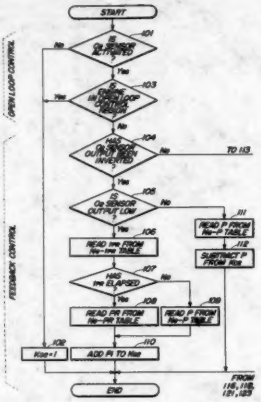
correcting the value of an air-fuel ratio control signal by varying said air-fuel ratio control signal value by a first predetermined correction value in response to a detected one of said first and second changes, and

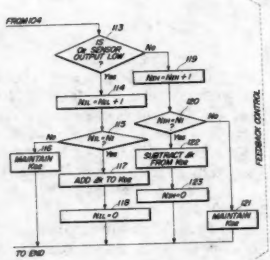
controlling the air-fuel ratio of said mixture in response to the value of said air-fuel ratio control signal thus corrected, to thereby effect said feedback control of the air-fuel ratio,

the method comprising the step of:

(a) applying a second predetermined correction value which is different from the first predetermined correction value, in lieu of said first predetermined correction value, to said correction of said air-fuel ratio control signal in response to a selected one of said first and second changes, with a

cycle a predetermined number of times as large as the fluctuation cycle of said output signal; and





(b) controlling the air-fuel ratio of said air-fuel mixture by the use of the value of said air-fuel ratio control signal thus corrected, to thereby effect said feedback control.

4,617,902

APPARATUS FOR CONTROLLING FUEL INJECTION TIMING OF FUEL INJECTION APPARATUS

Yutaka Hirano; Kazuo Inoue, both of Higashimatsuyama, and Seishi Yasuhara, Yokohama, all of Japan, assignors to Diesel Kiki Co., Ltd., Japan

Filed Dec. 10, 1984, Ser. No. 679,802

Claims priority, application Japan, Dec. 9, 1983, 58-231564

Int. Cl.⁴ F02D *41/14*

U.S. Cl. 123—501 **12 Claims**

1. An apparatus for controlling the fuel injection timing of a fuel injection device for an internal combustion engine having a sensor for producing an electric signal indicating the fuel injection timing in response to the fuel pressure at the time of fuel supply, an adjusting means for adjusting the fuel injection timing of a fuel injection pump and a first output means responsive to at least the electric signal for generating a control signal applied to the adjusting means in order to carry out feedback control of the fuel injection timing, said apparatus comprising:

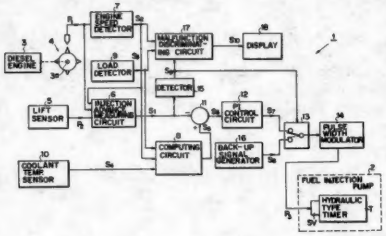
a first means for generating a first signal relating to the rotational speed of the internal combustion engine to which fuel is supplied from the fuel injection pump;

a second means for generating a second signal relating to the load on the internal combustion engine;

a detecting means for detecting whether or not the electric signal is being produced by the sensor;

a discriminating means responsive to the first and second signals and the output signals from the detecting means for discriminating whether or not the sensor is functioning properly;

a second output means for generating a back-up control signal for controlling the fuel injection timing by open-loop control;



a switch-over means for providing the back-up control signal to the adjusting means in place of the control signal in order to switch over the fuel injection timing control mode from feed-back control based on the control signal to open-loop control based on the back-up control signal when the detecting means detects that no electric signal is being generated by the sensor; and

means for giving an indication when a sensor malfunction has been discriminated by the discriminating means.

4,617,903

DIESEL ENGINE WITH INJECTION PUMP COORDINATED TO EACH CYLINDER

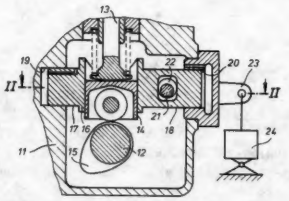
Hans-Jörg Heberle, Bodman-Ludwigshafen, and Wolfgang Rudert, Langenargen, both of Fed. Rep. of Germany, assignors to MTU Motoren und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Feb. 11, 1985, Ser. No. 700,178

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1984, 3425522

Int. Cl.⁴ F02M *59/20*

U.S. Cl. 123—501 **21 Claims**



1. A diesel engine, comprising an injection pump means coordinated to each cylinder, each injection pump means including a pump piston operable to be actuated by a cam by way of a roller tappet means, the roller tappet means being arranged in a tappet guide means, and adjusting means for displacing the tappet guide means in a plane which is substantially transverse to both the axis of rotation of the cam means and the longitudinal axis of the pump piston, each roller tappet means being arranged in an individual tappet guide means, each tappet guide means including two guide pins, the guide pins being axially displaceably supported in corresponding openings of a surrounding housing means, and the common

axis of the guide pins being arranged substantially at right angle to the axis of rotation of the cam means.

4,617,904

AIR/FUEL INDUCTION SYSTEM FOR A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

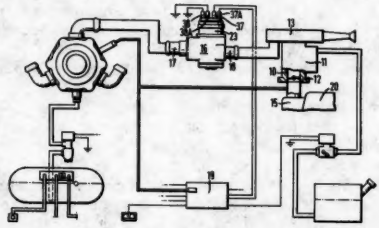
Brian C. Pagdin, Dunstable, England, assignor to Solex (U.K.) Limited, United Kingdom

Filed Nov. 28, 1983, Ser. No. 555,481

Claims priority, application United Kingdom, Dec. 1, 1982, 8234310; Dec. 13, 1982, 8235448

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—525 12 Claims



1. An air/fuel induction system for a multi-cylinder internal combustion engine comprising an air/fuel induction passage, a driver-operable throttle valve in the induction passage for controlling flow of air/fuel mixture to cylinders of the engine and a gaseous fuel system comprising a plurality of on/off injection valves each operable to control gaseous fuel flow from a common inlet chamber to a common outlet chamber by opening and shutting a respective orifice located between said inlet chamber and outlet chamber, the quantity of gaseous fuel injected by each valve being determined by the frequency of opening and the duration of each opening of the orifice, gaseous fuel supply means operable to supply gaseous fuel to said common inlet chamber, said common inlet chamber being immediately adjacent to and extending between said plurality of injection valves for selective communication with said common outlet chamber, and electrical control means responsive to certain operating conditions of the engine and operable to control operation of said on/off injection valves in accordance with those conditions so that they are operated sequentially and in synchronism with operation of the engine whenever the engine is running under its own power whereby each of said on/off injection valves emits a metered, pulsed output of gaseous fuel which is presented to a stream of air flowing through the induction passage through said common outlet chamber into which all said on/off injection valves are adapted to inject their metered, pulsed output of gaseous fuel directly, a conduit being provided by which said common outlet chamber is in conduit communication with said air/fuel induction passage whereby the separate metered, pulsed outputs of gaseous fuel injected directly into said common outlet chamber sequentially by said plurality of on/off injection valves are collected in said common outlet chamber and fed to said air/fuel induction passage by said conduit as a single substantially continuous supply of gaseous fuel.

4,617,905

ELECTRONIC IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

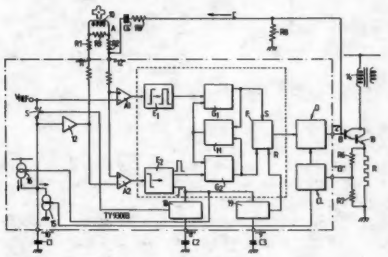
William F. Hill, Stafford, England, assignor to Lucas Electrical Electronics and Systems Ltd., Birmingham, England

Filed Mar. 19, 1985, Ser. No. 713,605

Claims priority, application United Kingdom, Mar. 28, 1984, 8408029; Dec. 14, 1984, 8431630

Int. Cl.[4] F02P *1/00*

U.S. Cl. 123—614 3 Claims



1. An internal combustion engine mechanically timed electronic ignition system comprising a variable reluctance transducer driven by the engine and including a winding which produces an output waveform having zero crossings coinciding with the desired instants of ignition sparks and a control circuit including a pair of input terminals for controlling current flow in an ignition coil, circuit means for connecting said winding to said input terminals, said control circuit comprising bias voltage generating means, first and second comparators connected to said bias voltage generating means and to said circuit means such that the first comparator compares the sum of the bias voltage and the voltage at said terminals with a reference value and the second comparator compares the voltage at said terminals with a threshold value, switch means which is triggered on by the first comparator to commence coil current flow when the combination of the bias voltage generated by said bias voltage generating means and the voltage at said terminals traverses said reference value in one direction and which is triggered off by the second comparator to interrupt current flow in the coil when the voltage at said terminals traverses said threshold value in the opposite direction, said bias voltage generating means forming part of a closed loop dwell control which is operated at higher running speeds of the engine, but disabled at lower engine speeds, and a minimum coil off timer circuit operating when the switch is triggered off, with the improvement that the control circuit includes (a) means for turning on the switch means if the output of the first comparator is already in the state to which it is driven following traversal past said reference voltage in said one direction at the expiry of the minimum coil-off timer period (b) means for preventing initiation of the timer period by the first comparator if the switch means is already on, and (c) means for preventing initiation of the timer period by the second comparator if the switch means is already off.

4,617,906

DWELL CONTROL FOR AN I.C. ENGINE SPARK IGNITION SYSTEM

William F. Hill, Stafford, England, assignor to Lucas Industries, Public Limited Company, Birmingham, England

Filed Mar. 22, 1984, Ser. No. 592,439

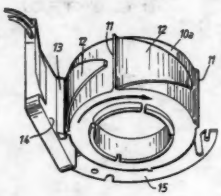
Claims priority, application United Kingdom, Apr. 5, 1983, 8309134

Int. Cl.[4] F02P *3/04*

U.S. Cl. 123—617 15 Claims

1. An internal combustion engine spark ignition control comprising a variable reluctance transducer driven by the

engine and providing an output having zero transitions coinciding with the desired instants of ignition, an integrating circuit to which the transducer output is connected, means for applying a variable preconditioning bias to the output of said integrating circuit, an ignition coil drive circuit connected to said integrating circuit and operating to commence coil current flow when and because the integrating circuit goes into a



saturated condition at an instant dependent on said variable bias means and to interrupt coil current flow to produce a spark when said integrating circuit comes out of said saturated condition on reversal of the polarity of the transducer output and means sensitive to the time fraction in each cycle during which the coil current is adequate to produce a spark to the ignition cycle duration, to control said variable bias means to cause said fraction to take up a desired value.

4,617,907

IGNITION UNIT IN THE IGNITION SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Sven H. Johansson, and Jan G. Nytomt, both of Amal, Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden

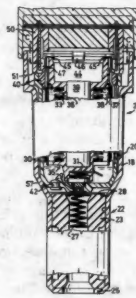
PCT No. PCT/SE84/00243, § 371 Date Apr. 2, 1985, § 102(e) Date Apr. 2, 1985, PCT Pub. No. WO85/00930, PCT Pub. Date Feb. 28, 1985

PCT Filed Jun. 28, 1984, Ser. No. 719,272

Claims priority, application Sweden, Aug. 5, 1983, 8304283

Int. Cl.[4] F02P *3/02*

U.S. Cl. 123—647 **8 Claims**



1. An ignition unit included in the ignition system of an internal combustion engine and including a plurality of finger-like connection pieces (2) extending from a common upper part (4) in the ignition unit and connectible to a corresponding number of spark plugs in the engine, said upper part including components included in a high-tension block, each connection piece (2) including an ignition element (20) with an ignition coil for generating ignition voltage, as well as a connection device (22) for connecting and for transmitting high-tension current to the engine spark plugs, characterized in that each ignition element (20) in the ignition unit has cable-free electrical connection both to contact means (47) in the upper part (4) and to contact means (27) in its connection device (22).

4,617,908

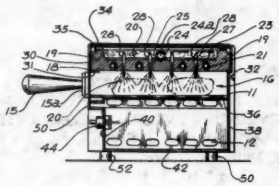
TOP-FIRING FOOD STEAMER

Dye O. Miller, Barrington; August J. Antunes, Oak Brook; Jerome Antunes, Clarendon Hills, and Ronald Godsen, Lombard, all of Ill., assignors to A. J. Antunes & Co., Addison, Ill.

Filed Aug. 12, 1985, Ser. No. 699,760

Int. Cl.[4] A21B *1/08*

U.S. Cl. 126—20 **23 Claims**



1. A top firing steam heating apparatus for heating foods or the like, comprising:

a housing;

a platen mounted on the housing to define a steam generating chamber between the platen and top of the housing;

means for heating the platen;

a food steaming chamber located beneath the steam generating chamber;

water inlet means for introducing water from a source thereof onto the heated platen to generate steam in the steam chamber;

aperture means extending through the heated platen to cause the steam generated within the steam generating chamber to be directed downwardly to impinge the top of food products placed in the food steaming chamber there below; and

a raised perimeter about the aperture means extending upwardly from the surface of the platen to permit the flow of steam downwardly from the steam generating chamber while preventing unvaporized water from reaching the food steaming chamber.

4,617,909

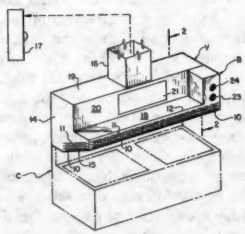
METHOD OF AND DEVICE FOR PREVENTING SMOKE CURLING FROM UNDERNEATH THE HOOD OF A GREASE EXTRACTION VENTILATOR

Victor D. Molitor, 2829 S. Santa Fe Dr., Englewood, Colo. 80110

Filed May 6, 1985, Ser. No. 730,600

Int. Cl.[4] F24C *15/20*

U.S. Cl. 126—299 R **22 Claims**



1. A method of preventing smoke curling from beneath a hood of a grease extraction ventilator installed in a room above cooking equipment and having depending walls including a front wall and end walls essentially surrounding an enclosure into which pass heated air and products of cooking, then through means for removing water, grease and other products

of cooking, to an exhaust duct to which suction is applied, comprising:

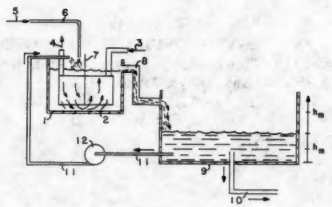
providing a series of apertures in at least the lower portion of said front wall from adjacent the lower edge thereof for a predetermined distance upwardly, said apertures being comparatively small and relatively closely spaced, whereby room air passes through said apertures into said enclosure.

4,617,910

APPARATUS AND METHOD FOR PRODUCING AND STORING HEATED LIQUID

Benoît Fardeau, Pierrefitte, France, assignor to GAZ de France, France

Filed Apr. 4, 1985, Ser. No. 719,804
Claims priority, application France, Apr. 5, 1984, 8405394
Int. Cl.[4] F24H *1/00*
U.S. Cl. 126—362 11 Claims



1. Apparatus for heating a liquid, comprising

a first tank for receiving the liquid to be heated,

heating means for heating the liquid in said first tank, said heating means situated within said first tank to be at least partially immersed in the liquid to be heated therewithin,

inlet means for introducing liquid from an external source into said first tank,

a second tank of larger volume than said first tank and communicating with the same, said second tank serving as a reservoir for the liquid heated in said first tank,

outlet means located near the bottom of said second tank for removing the heated liquid from the same, and means for varying the level of the liquid within said second tank comprising recirculating means for recirculating liquid from said second tank to said first tank;

whereby hot liquid at a substantially uniform temperature can be substantially instantaneously supplied.

8. Method for heating a liquid and storing the same, comprising the steps of

conveying the liquid to be heated into a first tank up to a level at least partially immersing heating means within the first tank,

heating the liquid within the first tank by the heating means at least partially immersed in the liquid,

conveying by overflowing the heated liquid from the first tank to a second tank of larger volume than said first tank serving as a reservoir for the heated liquid,

recirculating the heated liquid from said second tank to said first tank as required to maintain said heated liquid in said second tank at a desired temperature,

removing the heated liquid from the vicinity of a bottom of the second tank, when required,

introducing liquid from an external source into said first tank to replace the removed heated liquid as required, and

varying the level of liquid within said second tank,

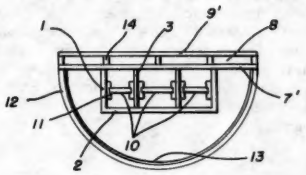
whereby hot liquid at a substantially uniform temperature can be substantially instantaneously supplied.

4,617,911

SOLAR HEATER

Rafael Adler, Derech Petah Tikva St., 7 Tel-Aviv, Israel

Continuation-in-part of Ser. No. 243,202, Mar. 12, 1981, abandoned. This application May 4, 1984, Ser. No. 607,269
Claims priority, application Israel, Mar. 20, 1980, 59675
Int. Cl.[4] F24J *2/10*
U.S. Cl. 126—438 21 Claims



1. A solar heater for directly heating a fluid supply thereto comprising:

a first transparent plate and a bottom plate being spaced apart at a predetermined distance and operatively connected by a plurality of partitions extending therebetween, side frame walls operatively connected to said first transparent plate and bottom plate, thereby forming a fluid flow space bounded by said side frame walls, said bottom plate and said first transparent plate, said partition plates for connecting said plates and providing a fluid flow path within said fluid flow space,

a fluid inlet operatively connected to said fluid flow space;

a fluid outlet operatively connected to said fluid flow space;

blackened plate means extending between said partitions or between said partitions and said side frame walls;

a concave member having a reflective material disposed on an inner surface thereof, said first transparent plate being positioned on said concave member to form a closed container between said inner surface of said concave member and the lower surface of said transparent plate; and

said first transparent plate, bottom plate, side frame walls and partitions being comprised of transparent material for permitting fluid in said fluid flow space to be directly heated by rays of the sun passing through said plates, side frame walls and partitions.

4,617,912

INCUBATOR

Christian Beer, Boniswil; Robert Riedweg, Luzern, and Klaus Schlensog, Cham, all of Switzerland, assignors to Ameda AG, Zug, Switzerland

Filed May 9, 1985, Ser. No. 732,291
Claims priority, application Switzerland, May 18, 1984, 2453/84
Int. Cl.[4] A61G *11/00*
U.S. Cl. 128—1 B 10 Claims

1. An incubator for neonatology comprising

a chamber substantially enclosed by

a transparent top casing having two longitudinal side walls and two transverse end walls in a substantially rectangular arrangement and a bottom shell for supporting said top casing comprising a generally rectangular recess having a bottom face and two longitudinal sides;

heating and aerating means, and

air distribution means for passing a stream of heated air through said chamber;

said top casing covering a substantially reactangular area of said bottom shell and said area having a length and a width;

said chamber including a pair of superimposed substantially rectangular trays;

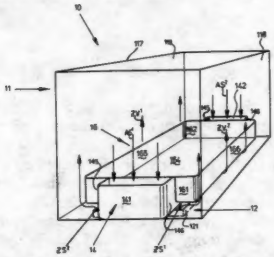
each of said trays having two longitudinal walls, two transverse end walls, and a bottom wall;

said trays being arranged with their bottom walls in a generally parallel and distanced relation when in normal operating condition; the lower of said trays having substantially the same length as said rectangular bottom shell area and a width smaller than said rectangular bottom shell area;

the upper of said trays being shorter and wider than said lower tray but having a width smaller than said rectangular bottom shell area;

a first air-conducting space formed between said bottom face of said recess and said bottom wall of said lower tray, and

a second air-conducting space formed between said bottom wall of said lower tray and said bottom wall of said upper tray;



a pair of air-passing longitudinal gaps formed between said lower tray and said longitudinal sides of said recess, each of said longitudinal gaps communicating with said first air-conducting space and extending over a predominant portion, at least, of said length of said rectangular bottom shell area at each of said side walls of said lower tray;

and a pair of transverse air-passing gaps formed between said end walls of said upper tray and said lower tray, each of said transverse gaps communicating with said second air-conducting space and extending over a major portion, at least, of said width of said rectangular bottom shell area;

said aerating means comprising a blower having a suction end and a blowing end,

said blowing end being connected with one of said air-conducting spaces and said suction and being connected with the other of said air-conducting spaces.

4,617,913

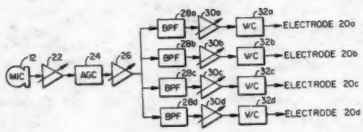
ARTIFICIAL HEARING DEVICE AND METHOD

Donald K. Eddington, Belmont, Mass., assignor to The University of Utah, Salt Lake City, Utah

Filed Oct. 24, 1984, Ser. No. 664,163

Int. Cl.[4] H04R *23/00*

U.S. Cl. 128—1 R **19 Claims**



1. A multichannel hearing device of the type which amplifies electrical signals which are representative of sounds and supplies said signals to the auditory nerve of a user through a plurality of electrodes implanted in the cochlea, wherein the improvement comprises

bandpass filter means for separating said electrical signals into a plurality of frequency component signals having different frequency ranges within the audio spectrum, each of the ranges having a predetermined center frequency,

voltage source to current source converter means connected to the bandpass filter means for separately converting said signals to electric currents representative of the frequency component signals of the original sounds, and for supplying the electric currents to separate ones of the implanted electrodes,

emphasis means connected in series with the bandpass filter means and the voltage source to current source converter means for causing the amplitudes of said frequency component signals, beyond what is necessary to produce a predetermined threshold response in the user, to increase at a predetermined number of dB per octave from the lowest center frequency to the highest center frequency of the component signals.

4,617,914

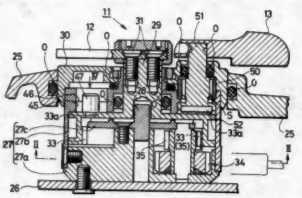
END CURVING DEVICE FOR ENDOSCOPE

Hirohisa Ueda, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1985, Ser. No. 743,730

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **9 Claims**



1. An end curving device for an endoscope in which at least one pair of operating wires are connected to a curving section provided at a front end of an inserting section adapted to be inserted into a human body, and an operating lever in an operating section is operated to push and pull said pair of operating wires to curve said curving section, wherein the improvement comprises:

an internal gear integrally formed on a shaft of said operating lever and rotatably supported in said operating section;

a first pinion;

a pair of racks coupled to respective ones of said pair of operating wires and engaged with said first pinion; and

a second pinion integral with said first pinion and engaged with said internal gear.

4,617,915

CONSTRUCTION OF MANUAL CONTROL SECTION OF ENDOSCOPE

Satoshi Arakawa, Oomiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Japan

Filed Apr. 23, 1985, Ser. No. 726,398

Claims priority, application Japan, Apr. 24, 1984, 59-60513[U]; Apr. 24, 1984, 59-60514[U]; Apr. 24, 1984, 59-60515[U]; Apr. 24, 1984, 59-60516[U]

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **4 Claims**

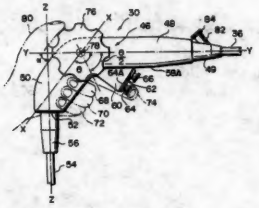
1. An endoscope adapted to be held by an operator, comprising:

an insertion section having foreward and rearward ends, said

foreward end including a solid state imaging device for sensing an image;

a connector section connected to said rearward end of said insertion section along a common axis with said rearward end;

a grip section connected to said connector section and arranged along an axis which is inclined with respect to said common axis of of said connector section and said inser-



tion section by an angle θ, wherein θ is between 90° and 180°, said grip section and said connector section defining a pistol-shaped member having a rearward face, said rearward face being oriented closest to the operator when said endoscope is in use; and

transmission means and push-button control means connected to said endoscope, said transmission means and push-button control means being located such that said rearward face of said endoscope is unobstructed.

4,617,916

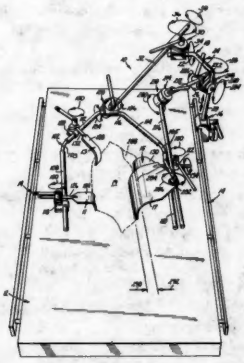
RETRACTOR APPARATUS

Bruce A. LeVahn, New Brighton, and Robert E. Olson, Roseville, both of Minn., assignors to Minnesota Scientific, Inc., Minneapolis, Minn.

Filed Nov. 8, 1984, Ser. No. 669,362

Int. Cl.[4] A61B *17/02*

U.S. Cl. 128—20 **24 Claims**



1. A retractor apparatus for attachment to a rail of a surgical table for attaching retractors thereto to hold back tissue proximate an incision in a body, the apparatus comprising:

a first rigid support rod having a lower section and an upper section;

first clamping means for clamping the lower section of the first support rod to the surgical table and permitting movement about the lower sections's axis and movement along the lower section's axis;

a second rigid support rod having a first end portion and a second end portion;

second clamping means for clamping and connecting the first end portion of the second rod with the upper section of the first support rod, said second clamping means having means for permitting movement about an axis of the upper section of the first support rod and about an axis of the first end portion of the second support rod and having means for permitting pivotal movement between the second rod and the first rod about an axis extending through said second clamping means;

a third rigid support rod for attaching a retractor thereto and having first and second leg portions extending along opposite sides of the incision; and

third clamping means for clamping and connecting the second end portion of the second rod with the third rigid support rod, said third clamping means permits movement about the axis of the second end portion of the second rod and permitting movement about an axis of the third rigid support rod.

4,617,917

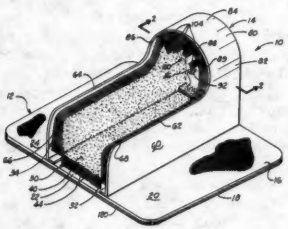
FOOT HYGIENE DEVICE

Griffith C. Miller, Norman, Okla., assignor to Dr. Miller's Health Care Products, Inc., Norman, Okla.

Filed Jan. 9, 1984, Ser. No. 569,495

Int. Cl.[4] A46B *5/00*; A61H *7/00*

U.S. Cl. 128—62 R **10 Claims**



10. A foot hygiene device comprising:

a base plate having a first portion, a medial portion and a second portion, the first and second portions being of sufficient dimension to enable a person's foot to be placed thereon;

stabilizing means secured to a lower surface of the base plate for releaseably securing the base plate on a supporting surface; and,

a brush assembly supported by the medial portion of the base plate, said brush assembly having a foot receiving passageway formed therein such that upon positioning one foot in the foot receiving passageway, while securing the base plate by placement of the other foot on one of the first and second portions of the base plate, and thereafter moving the one foot in a to and fro direction within the foot receiving passageway said brush assembly selectively contacts at least one of the ventral surfaces one of the lateral surfaces, and the dorsal surface of the foot disposed within the foot receiving passageway in a scrubbing action to clean said selected surfaces of the foot, said brush assembly comprising:

a ventral brush supported by the medial portion of the base plate, said ventral brush having a plurality of upstanding filament tufts for applying a scrubbing force to the ventral surface of the foot upon movement of the foot in a to and fro direction within the foot receiving passageway so that the ventral portion of the foot scrubbingly contacts the ventral brush;

a pair of spatially disposed lateral brushes supported by the base plate so that one of the lateral brushes is dis-

posed substantially adjacent one side of the ventral brush and the other of the lateral brushes is disposed substantially ajdacent an opposite side of the ventral brush, each of the lateral brushes extending upwardly from the base plate and having a plurality of lateral filament tufts disposed in a facing relationship and substantially normally disposed to the upstanding filament tufts of the ventral brush, the lateral filament tufts applying a scrubbing force to at least one of the lateral surfaces of the foot upon movement of the foot in the to and fro direction within the foot receiving passageway such that at least one of the lateral surfaces of the foot scrubbingly contacts the adjacently disposed lateral brush; and,

a dorsal brush supported by a distal end portion of the lateral brushes so as to be positioned a selected distance from the ventral brush and defines the foot receiving passageway, said dorsal brush having a plurality of downwardly extending dorsal filament tufts, the dorsal filament tufts applying a scrubbing force to a dorsal surface of the foot upon movement of the foot in the to and fro direction within the foot receiving passageway such that the dorsal surface of the foot contacts the dorsal filament tufts of the dorsal brush, said dorsal brush comprising:

a bridge member having a first end, a medial portion and a second end, the first end supported by one of the lateral brushes and the second end supported by the other of the lateral brushes so that the medial portion forms an arch over one end portion of the ventral brush, the medial portion of the bridge member having a plurality of mutually spaced apertures formed on a lower side; and,

a plurality of synthetic filaments extending from a prefused homogeneous mass of filament mateial, each of said prefused masses received in one of the apertures in the bridge member and conforming to the geometric confines of said apertures to hold said dorsal filament tufts to the bridge member; and digital brush means supported by the bridge member for cleaning the digits of the foot as the foot is moved in a to and fro direction, the digital brush means extending downwardly and having a length greater than the dorsal filament tufts of the bridge member.

4,617,918

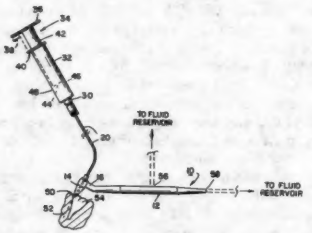
DEVICE FOR COMBINED THERAPEUTIC AND STIMULATIVE TREATMENT OF THE GUMS

John J. Donohue, Neshanic, N.J.; William J. Dunn, Libertyville, Ill., and Kedar N. Rustogi, Kendall Park, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 392,975, Jun. 28, 1982, abandoned. This application Oct. 3, 1984, Ser. No. 657,287

Int. Cl.[4] A61H *9/00*

U.S. Cl. 128—66 **3 Claims**



1. A device for the combined therapeutic and stimulative treatment of the gums comprising an elongated handle member terminating proximally in a flexible tip portion provided with an aperture for the discharge of fluid at low pressure and configured to expedite probing contact of the tip portion with gingival sulcus, a fluid reservoir with a portion thereof movable along the longitudinal axis of the reservoir by an applied force and physically separate from the handle comprising a pressurized or pressurizable unit whose flow rate is controllable to deliver a fluid at a low pressure, and conduit means connecting the tip portion with the fluid reservoir to communicate the fluid from the reservoir to the tip portion.

4,617,919

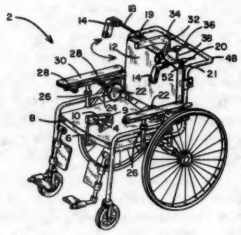
WHEELCHAIR WITH POSTURE SUPPORTS

Robert B. Suhre, Lakeville, Minn., assignor to Theradyne Corporation, Lakeville, Minn.

Filed Sep. 6, 1983, Ser. No. 529,517

Int. Cl.[4] A61F *5/02*

U.S. Cl. 128—78 **13 Claims**



1. Posture support apparatus comprising in combination:

a wheelchair in which an individual can be seated having a frame, a seat, a back, and two arms;

a plurality of adjustable support means attached to the chair for therapeutically supporting said individual in a select posture, an adjustment means associated with each support means for adjusting the position and angular orientation of its associated support means with respect to said wheelchair, moving means for moving at least one of said support means with respect to said wheelchair and independently of its associated adjustment means, to facilitate seating or unseating of the individual in the chair without disturbing the setting of said associated adjustment means; and

wherein one of said adjustable support means includes a leg support means for separating the thighs of the individual.

4,617,920

DEVICE FOR FACILITATING THE PRACTICE OF DOWNHILL SKIING

Charles Carsalade, 118 rue Crozet Boussingault, 42100 Saint-Etienne, France

Filed Feb. 4, 1985, Ser. No. 697,791

Claims priority, application France, Feb. 10, 1984, 84 02542

Int. Cl.[4] A61F *3/00*; **A41D** *13/00*

U.S. Cl. 128—80 C **8 Claims**

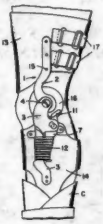
1. A device for facilitating downhill skiing practice, including a knee bandage comprising:

an upper curved and profiled plate, the upper plate being attachable around a user's thigh;

a lower curved and profiled plate attachable around the user's lower leg, the lower plate being partly securable by a part of a shoe of the user;

two opposite and parallel arms extending downwardly from the upper plate, the arms extending from the upper plate being profiled and articulated on a shaft on either side of the user's knee, and two further opposite and parallel arms extending upwardly from the lower plate, the arms extending from the lower plate being profiled and articulated on the shaft with the arms of the upper plate;

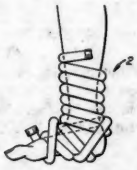
elastic components biasing the upper and lower plates articulated on the shaft, the elastic components being tensioned to oppose flexing of the upper and lower plates up to a certain flexion angle; and,



means including a manual releasing component operative to fully suppress biasing of the upper and lower plates and relieve the tensioning.

4,617,921
THERMALLY ACTUATED IMMOBILIZING STRUCTURE

C. Oliver Seeler, P.O. Box 246, Albion, Calif. 95410
Filed Jan. 25, 1985, Ser. No. 694,877
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—89 R **27 Claims**

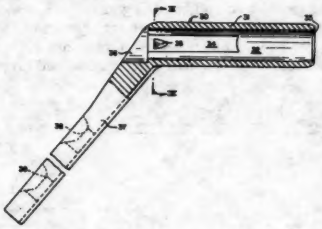


27. A thermally actuated immobilizing structure comprising:
a strand ensemble including elongate, generally parallel, closely grouped strands; and
a thermoplastic material interspersed among the strands, said strands and said thermoplastic material adapted to permit relatively unhindered relative movement among the strands when said thermoplastic material is flowable and to substantially inhibit relative movement among the strands when said thermoplastic material is solid to lock the strands in place.

4,617,922
COMPRESSION SCREW ASSEMBLY

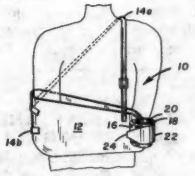
Calvin Griggs, Memphis, Tenn., assignor to Richards Medical Company, Memphis, Tenn.
Division of Ser. No. 340,093, Jan. 18, 1982, Pat. No. 4,530,355. This application Nov. 28, 1984, Ser. No. 675,933
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 YS **3 Claims**

1. A compression plate for a compression screw assembly comprising a hollow barrel member having a first engaging means formed therein, said first engaging means adapted to coact with a complementary engaging means formed on the outer surface of a lag screw for receiving the lag screw in at least one fixed orientation and said first engaging means and said complementary engaging means being proportioned relative to each other to accept therebetween a means for being optionally insertable into said barrel member in order to selectively prevent axial rotation of the lag screw with respect to said barrel member, said barrel member having a second engaging means formed therein for coacting with said optionally insertable means.



4,617,923
SLING

Michael Coleman, 6666 Security Blvd., Baltimore, Md. 21207
Filed Jan. 24, 1985, Ser. No. 694,349
Int. Cl.[4] A61F *5/40*
U.S. Cl. 128—94 **5 Claims**



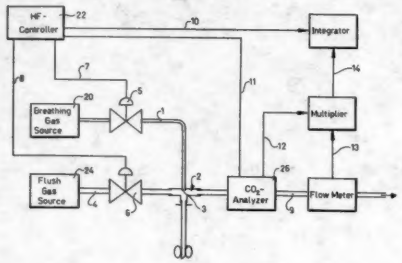
1. An arm sling having a pocket portion in which a patient's arm is supported, a supporting means; and
a grasping means which is grasped by a patient's hand to maintain the muscles of the hand and prevent contracture thereof, grasping means comprising a grasping tube about which said patient's hand fits, said sling having a hole at a sling distal end through which fingers of the patient's hand pass, said sling hole and said grasping tube being arranged to interlock, said grasping tube being hollow so that a portion of said sling adjacent to said sling hole, is within said hollow of said grasping tube, said sling including a securing means which holds said patient's fingers about said grasping tube.

4,617,924
METHOD AND APPARATUS FOR ARTIFICIAL RESPIRATION AND THE MEASUREMENT OF BREATHING GAS VALUES

Ulrich Heim, Reinfeld, and Peter Gebhardt, Stockelsdorf, both of Fed. Rep. of Germany, assignors to Drägerwerk AG, Fed. Rep. of Germany
Filed Jan. 18, 1985, Ser. No. 693,016
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401841
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—204.23 **10 Claims**

1. A ventilating system comprising a breathing gas source for supplying a flow of breathing gas, a breathing gas supply line having one end connected to said breathing gas source and having an opposite end with a jet nozzle, a breathing gas supply device having one end connected to said opposite end of said breathing gas supply line for receiving the flow of breathing gas over said jet nozzle, a flushing gas line connected into

said breathing gas supply device, an always open outlet line connected into said breathing gas supply device, said breathing gas supply device having an end for connection to a patient, a breathing gas valve in said breathing gas line for regulating the breathing gas flow to said breathing gas supply device, a flush gas valve in said flushing gas line for regulating the flow of flushing gas to said breathing gas supply device and to said outlet line, and control means connected to said breathing gas



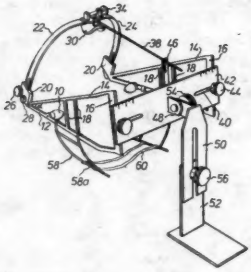
valve and said flushing gas valve for providing the flow of breathing gas through said breathing gas valve in high frequency pulses for a predetermined period and said flushing gas through said flushing gas valve for a predetermined period and providing a measuring interval in which said breathing gas valve and said flushing gas valve are closed, and measuring means connected to said outlet for measuring breathing gas values during the measuring interval.

4,617,925

ADAPTER FOR DEFINITION OF THE POSITION OF BRAIN STRUCTURES

Lauri V. Laitinen, Nydalavägen 59, S-902 34 Umeå, Sweden

Filed Sep. 28, 1984, Ser. No. 655,671
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 B **12 Claims**



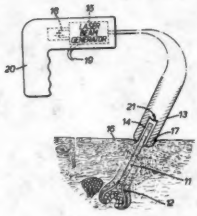
1. Adapter for definition of the position of brain structures on a patient's head by means of spatial coordinates in computerized tomography and NMR examination and transferring the coordinates to a stereotactic apparatus, said adapter including ear supports (**10**) carried by a first arm (**12**) and a further support (**30**) for reproducible fixation of the adapter to the patient's head, with two side frame parts adapted to be fitted on either side of the patient's head, wherein the adapter includes a second arm (**14**) extending angularly to said first arm (**12**) and forming together with the first arm (**12**) and a further, third arm (**16**) a triangular side frame structure (**12, 14, 16**), the side frame parts on either side of the patient's head being interconnected by means of connecting means (**22, 24, 42**) which carry the further support (**30**) and a laterality indicator means (**38, 58*a***) consisting of an anterior laterality indicator (**38**) and two posterior laterality indicators (**58*a***) for definition of a reference plane through the midline of the adapter.

4,617,926

DEPILATION DEVICE AND METHOD

A. Gunilla Sutton, 19, Tregunter Road, London SW10, United Kingdom

Filed Jan. 30, 1984, Ser. No. 574,922
Int. Cl.[4] A61N *5/00*
U.S. Cl. 128—303.1 **12 Claims**



1. A depilation device comprising a probe having an optic fiber with a bore in the tip of the fiber, said bore being of a size for accommodating a hair therein so that energy transmitted through the optic fiber will impinge directly on the hair.

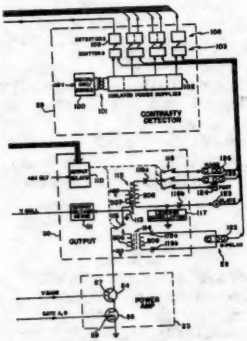
11. A method of destroying an unwanted mammalian hair by applying a pulse of light energy by means of an optic fiber into the end of the hair, along the hair and hence into the hair follicle to destroy the follicle.

4,617,927

ELECTROSURGICAL UNIT

Michael R. Manes, Littleton, Colo., assignor to Aspen Laboratories, Inc., Englewood, Colo.

Filed Feb. 29, 1984, Ser. No. 584,959
Int. Cl.[4] A61B *17/39*
U.S. Cl. 128—303.14 **4 Claims**



1. An electrosurgical unit comprising:

a. a direct current power source;

b. a means for amplifying connected to said power source, said means comprising:

first and second semiconductor devices each having an input, an output, and a control terminal for controlling the electrical flow through the device, said semiconductor devices connected in series with each other and in series with the load of said means for amplifying; a first voltage control means for applying a control voltage to said control terminal of said first semiconductor device,

said first voltage control means including a means for varying the control voltage over a range corresponding to at least a plurality of conducting states of said first semiconductor device, and said first voltage control means including a feed forward gain compensator to substantially maintain the control voltage for said first voltage control means constant for one of said plurality of conducting states in response to variations in the output of said direct current power source, said first semiconductor device comprising a bipolar transistor and said second semiconductor device comprising a field effect transistor; and

a second voltage control means for applying a control voltage to said control terminal of said second semiconductor device; and

c. a means for electrically connecting said means for amplifying to electrosurgical electrodes.

4,617,928

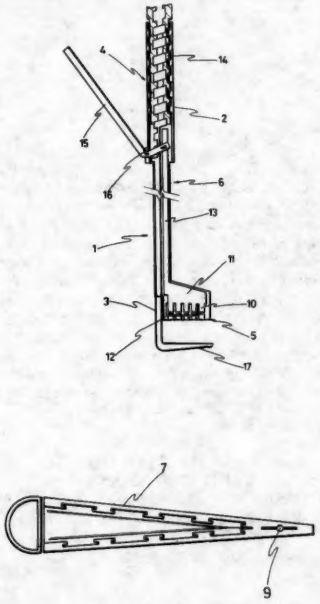
SURGICAL INSTRUMENT FOR PRACTICING MECHANICAL SUTURES AND BIOPSIES

José-María P. Alfranca, Santa Teresa, 29-35, esc. 1ª-6º A, 50006 Saragossa, Spain

Filed Sep. 17, 1984, Ser. No. 651,610

Int. Cl.⁴ A61B *17/11, 17/32, 17/04*

U.S. Cl. 128—305 **7 Claims**



1. A surgical instrument for placing suture staples and performing biopsies, comprising:

a fixed leg having an upper body and a lower body connected to said upper body, said upper body defining a channel and said lower body comprising a fixed frame, said frame having a lower triangular face and positioning means for arranging a plurality of suture staples in a V-shaped configuration adjacent said face, said triangular face including openings for staples in said positioning means;

a movable leg slidably engaged in said channel and having a triangular anvil movable toward and away from said triangular face of said fixed frame, said anvil having an upper triangular surface for interaction with and the closing of staples from said frame, and a blunt end;

slide means in said upper body between said fixed leg and said movable leg for sliding said movable leg with respect to said fixed leg;

a staple pusher movably mounted in said lower body of said fixed leg for pushing staples out of said positioning means into engagement with said triangular surface of said anvil;

release means engaged with said fixed leg and connected to said staple pusher for moving said staple pusher; and

a V-shaped cutting blade conencted to and movable with said staple pusher beyond said face of said frame for cutting tissue between said frame face and said anvil surface, said openings for staples in said face of said frame being disposed outwardly of said V-shaped blade, said blade having two conveying blade portions converging to an apex where said blade portions meet, said blade portions having bases opposite from said apex which are spaced from each other, whereby an open cut is formed by said blade.

4,617,929

SURGICAL APPLIANCE AND A METHOD FOR INTRODUCING DRAINAGE TUBING INTO CAVITIES

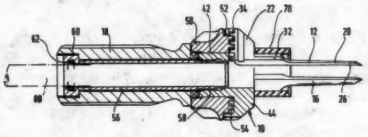
Steven S. Gill, 17A Hampstead Hill Gardens, Hampstead, London NW3, England

Filed Jun. 18, 1984, Ser. No. 621,521

Claims priority, application United Kingdom, Jun. 18, 1983, 8316640

Int. Cl.⁴ A61F *17/32*

U.S. Cl. 128—305.3 **7 Claims**

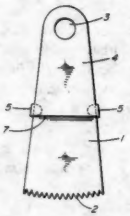


1. A surgical appliance capable of being temporarily placed in a body for assisting in the passage of a tube through a puncture formed in the skin of the body, contraction of the skin around the tube, once the appliance is removed, assisting in holding the tube in place, said surgical appliance comprising: a trochar having a proximal end, a distal end and being divided into a plurality of separate components; at least one tooth on the proximal end of each of said components; a rotary actuator for said plurality of trochar components, said actuator having a central channel therethrough, a spiral formation on said actuator cooperating with said teeth on said trochar components so that rotation of said actuator about the longitudinal axis of said trochar produces parallel radial motion of each of said trochar components having at least one tooth thereon with respect to each other from a closed position in which such components lie substantially parallel and adjacent to each other thereby to form a composite trochar to an open position wherein such components are substantially axially parallel with each other and separated radially to create a trochar central channel through said trochar components, said trochar central channel formed within said trochar components forming a continuation of said first named central channel through said actuator to provide channel means within said appliance through which a tube can be positioned with one end thereof extending into the puncture, and said appliance being capable of being removed from around the tube to leave only the tube in place within the puncture formed in the skin, contraction of the skin adjacent the puncture around the tube upon removal of said appliance assisting in holding the tube in place.

4,617,930
BLADE STIFFENER

Gerald A. B. Saunders, Sydenham, Canada, assignor to Queen's University at Kingston, Kingston, Canada

Filed May 16, 1984, Ser. No. 607,008
Int. Cl.[4] A61B *17/14*
U.S. Cl. 128—317 1 Claim

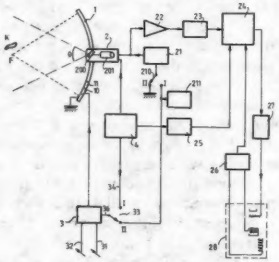


1. A stiffener for use in overlying abutting relationship with an orthopaedic saw blade having a cutting edge at one longitudinal end thereof and hole means adjacent the other longitudinal end thereof adapted to releasably secure said blade to a saw power unit; said stiffener comprising a longitudinal planar element adapted to extend in overlying planar relationship with said saw blade from said other end thereof to a point intermediate said other end and said cutting edge, and including hole means at one end thereof adapted to releasably secure said stiffener to said saw power unit at one end thereof and clip means at the other end thereof to releasably engage said stiffener with said saw blade at said intermediate point.

4,617,931
ULTRASONIC PULSE APPARATUS FOR DESTROYING CALCULUSES

Jacques Dory, 991, rue des Molveaux, 77450 Coupvray Esblay, France

Filed Nov. 26, 1984, Ser. No. 674,889
Claims priority, application France, Dec. 14, 1983, 83 20041
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—328 7 Claims



1. A lithotrite for contact free pulsed wave disintegration of calculi, said lithotrite comprising:

(i) high power ultrasonic pulse generator means;

(ii) piezoelectric transducer means having a spherical transmissive surface portion, in contact with a water-containing enclosure and adapted to focus the disintegrating waves at a focal spot substantially located at the center of the said spherical surface, said center being located out of said water-containing enclosure;

(iii) means connecting the said pulse generator means to said piezoelectric transducer means;

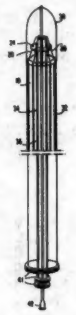
(iv) image forming means for displaying an image of the said calculus and a representation of the position of the said focal spot; and

(v) means for displacing the said piezoelectric transducer means to bring the said image and the said representation into coincidence.

4,617,932
DEVICE AND METHOD FOR PERFORMING AN INTRALUMINAL ABDOMINAL AORTIC ANEURYSM REPAIR

Elliot Kornberg, Suite 416, Cape Royal Bldg., 1980 N. Atlantic Ave., Cocoa Beach, Fla. 32931

Division of Ser. No. 603,800, Apr. 25, 1984, Pat. No. 4,562,596.
This application Sep. 3, 1985, Ser. No. 771,913
Int. Cl.[4] A61B *17/04;* A61F *2/06*
U.S. Cl. 128—334 R 8 Claims

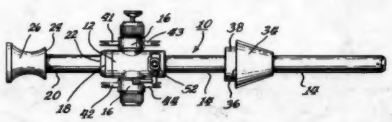


1. A device for inserting a graft into an artery which allows the graft to be positioned and securely attached inside the abdominal aorta proximally to the aneurysm and thus excluding the aneurysm from the circulation comprising a plurality of nested tubes, said tubes each having an upper end and a lower end, one of said tubes designated a first tube being provided at its upper end with means for guiding and positioning arm means, said arm means being movably attached to the upper end of another of said tubes being located inside said first tube extending somewhat above said first and outer tube, the lower ends of said tubes being adaptable for fastening means, the end of the inside tube extending below the end of the outer tube.

4,617,933
LAPAROSCOPE CANNULA WITH IMPROVED SUTURE RECEIVING MEANS

Harrith M. Hasson, 345 Fullerton Pky., Chicago, Ill. 60614

Filed Feb. 19, 1980, Ser. No. 122,240
Int. Cl.[4] A61M *25/00*
U.S. Cl. 128—348.1 2 Claims



1. A laparoscope cannula comprising a proximal shaft portion forming an inlet to receive a blunt obturator and a laparoscope, a distal shaft portion for insertion into the abdominal cavity of a patient, gas valve means coupling the proximal shaft portion and the distal shaft portion, an adjustable sleeve positioned on the distal shaft portion, and rigid means carried by the cannula for receiving a suture to maintain the cannula in place with respect to the patient's abdomen; characterized in

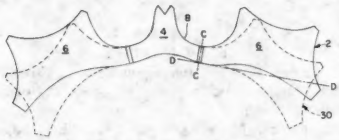
that the suture-receiving means comprises first, second, third and fourth rigid members extending from the cannula, with each of said four rigid members defining a slot which opens to the outside and tapers inwardly toward the cannula, each of said rigid members being fixed at one end thereof to the cannula and being adapted to grasp sutures between opposed walls defining the respective slot, said second and fourth rigid members extending from the cannula on an opposite side from said first and third rigid members, with the four rigid members being symmetrical with respect to the distal shaft portion, said third rigid member being positioned coaxial with said first rigid member and said fourth rigid member being positioned coaxial with said second rigid member, said rigid members extending parallel to the axis of the cannula.

4,617,934

BRASSIERE FRAME

William C. Hittel, New Hyde Park, N.Y., assignor to International Playtex, Inc., Stamford, Conn.

Filed Jul. 25, 1985, Ser. No. 759,024
Int. Cl.⁴ A41C *3/00, 1/14*
U.S. Cl. 128—425 **11 Claims**



1. A brassiere frame for use in conjunction with a pair of breastcup supports, comprising:

a front portion;

a pair of side panels, each of said pair of side panels made of a substantially elastic material, and each of said pair of side panels having a lower marginal edge and being of a particular pitch, whereby the lower marginal edge is basically on the diaphragm line of the body of a wearer when said brassiere frame is on the body of the wearer;

a pair of breast cups, each of said pair of breast cups adjacent and connect to said front portion and a different one of said pair of side panels, each of said pair of breast cups having an almost perfect U shape configuration,

wherein said brassiere frame provides for anchoring of breast supporting forces at the base of said pair of breast cups, and for substantially one directional transmission of the non-breast supporting forces in said brassiere frame.

4,617,935

MEDICAL ELECTRODE

James V. Cartmell; Michael J. Allaire, both of Dayton, and Michael L. Wolf, West Milton, all of Ohio, assignors to NDM Corporation, Dayton, Ohio

Filed Mar. 12, 1985, Ser. No. 710,994
Int. Cl.⁴ A61B *5/04*
U.S. Cl. 128—641 **25 Claims**

1. A medical electrode comprising:

electrically insulating means forming a tray having a cavity, said tray forming means comprising a cover member forming the base of said tray, and a frame connected to said cover member and forming a sidewall around said cavity;

conductor means supported by said cover member having one portion located within one portion of said tray and another portion projecting outwardly of said cover member for transmitting signals between the skin of a patient and peripheral equipment, said conductor means extending only into said one portion of said tray and not into the remainder of said tray; an electrolyte gel matrix filling said cavity and having one portion engaging and covering said one portion of said conductor;

electrically insulating platform means connected to said frame and spanning across a first part of said gel matrix including said one portion of said electrolyte gel matrix covering said conductor means for providing a barrier that covers and thereby shields said one portion of said gel matrix from either chemical or physical interaction with

the skin of a patient to which the electrode may be applied, said first part of said gel matrix comprising less than the entire said matrix, and said gel matrix having a second part exposed by said tray and said platform means for engagement with the skin of a patient; and

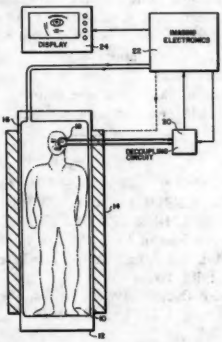
adhesive means for adhering said platform means and said frame to the skin of a patient with said second part of said electrolyte gel matrix engaging the skin.

4,617,936

FLEXIBLE SURFACE COIL FOR MAGNETIC RESONANCE IMAGING

John A. Malko, Dunwoody, Ga., assignor to North American Philips Corporation, New York, N.Y.

Filed Aug. 8, 1985, Ser. No. 763,724
Int. Cl.⁴ A61B *5/05*
U.S. Cl. 128—653 **7 Claims**



1. In magnetic resonance imaging apparatus of the type which includes: magnet means for generating a homogeneous magnetic field and one or more gradient magnetic fields within an examination space: exciting means for generating an alternating magnetic field within the examination space; and surface coils means disposed within the examination space and adapted for placement on the surface of a body undergoing examination for detecting magnetic resonance signals which originate within a localized volume in the body, the improvement wherein:

the surface coil means comprises one or more turns of a

flexible, electrically-insulating tube and an electrically-conductive liquid disposed within and filling said tube.

4,617,937

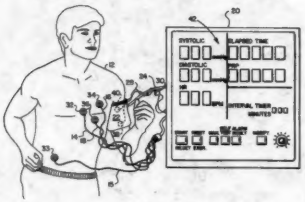
BLOOD PRESSURE MONITORING SYSTEM

Harry H. Peel; John S. Brisco; Mark E. Moczygemba; Robert L. Neatherlin, and Brenda A. Sargent, all of San Antonio, Tex., assignors to Nippon Colin, Komaki, Japan

Continuation of Ser. No. 702,226, Feb. 21, 1985, abandoned. This application Sep. 20, 1985, Ser. No. 778,290

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—680 **34 Claims**



1. A blood pressure monitoring system for measuring blood pressure during stress testing or other physical activity, said blood pressure monitoring system comprising:

an inflatable cuff adapted to encircle a patient's arm;

means for inflating and deflating said inflatable cuff within a selected range of pressures;

pressure transducer means responsive to cuff pressure and having an output signal indicative thereof;

audio transducer means for detecting pulse sounds at said inflatable cuff;

a plurality of electrocardiographic leads, each coupling an electrocardiographic signal from said patient; and

controller means comprising:

trigger signal generation means coupled to said plurality of electrocardiographic leads for periodically measuring the amount of noise present on each of said plurality of electrocardiographic leads and for selecting a particular lead having the least amount of noise to be utilized as a trigger signal; and

measurement means for obtaining a measure of systolic and diastolic blood pressure from said pulse sounds at selected cuff pressures in response to said trigger signal.

4,617,938

METHOD AND SYSTEM FOR DISTINGUISHING R-WAVE ELECTROCARDIOGRAPH SIGNALS FOR SYNCHRONIZING PURPOSES

Yair Shimoni, c/o Elscint Ltd., P.O. B. 5258; Amir Gilad, 42 Sederot Hatzvi, and Alex Shapira, c/o Elscint Ltd., P.O. B. 5258, all of Haifa, Israel

Filed Dec. 26, 1984, Ser. No. 686,389

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—708 **16 Claims**

1. A system for distinguishing R-waves in electrocardiograph (ECG) signals, said system comprising:

(a) a plurality of leads inputting at least two individual ECG signals from the same patient;

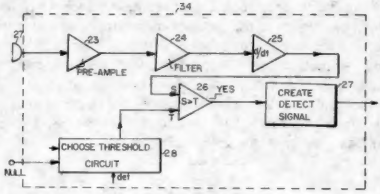
(b) single channel detector means for detecting suspected R-waves in each of said at least two individual ECG signals; said single channel detector means comprising:

(1) means for determining the negative slopes of said ECG signals;

(2) choose threshold means using the determined slopes for providing variable threshold signals individual to each of said at least two ECG signals;

(3) means for comparing the determined slopes of the ECG signals to said provided threshold signals; and

(4) means responsive to said determined slopes being more negative than said provided threshold signals for generating a "det" signal indicating a suspected R-wave;



(c) means for determining the simultaneous receipt of said "det" signals from each of said single channel detector means; and

(d) means operated responsive to the simultaneous receipt of the "det" signals for recognizing the suspected R-wave signals as actual R-wave signals and generating a signal indicating the detection of actual R-wave signals.

4,617,939

TOMOGRAPHY

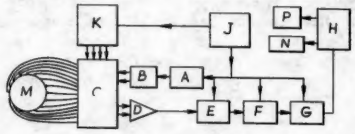
Brian H. Brown; David C. Barber, and Ian L. Freeston, all of Sheffield, England, assignors to The University of Sheffield, Sheffield, England

Continuation of Ser. No. 489,415, Apr. 28, 1983. This application Jun. 14, 1985, Ser. No. 745,291

Claims priority, application United Kingdom, Apr. 30, 1982, 8212676; Jun. 14, 1984, 8415236

Int. Cl.[4] A61B *5/05*

U.S. Cl. 128—734 **11 Claims**



1. A method for the construction of tomographic images of a body comprising placing a plurality of electrodes adjacent the skin at spaced intervals on the body, causing currents to flow in the body by applying an electrical potential between pairs of electrodes in turn, and measuring potentials between other pairs of electrodes, calculating potentials for each electrode pair on an assumption that the body consists of one uniform medium, plotting isopotentials corresponding to the calculated potentials to create an assumed image of the body, obtaining a ratio between the measured potential and the calculated potential for each electrode pair, and modifying the assumed image by back projecting respective ratios for each electrode pair along the plotted isopotentials and thereby increasing impedance along each plotted isopotential in proportion to a ratio greater than unity or decreasing the impedance in proportion to a ratio less than unity.

4,617,940

BRONCHOSCOPIC NEEDLE ASSEMBLY

Ko Pen Wang, 813 Jamieson Rd., Lutherville, Md. 21093

Division of Ser. No. 438,245, Nov. 1, 1982, which is a continuation-in-part of Ser. No. 260,602, May 6, 1981, abandoned. This application Mar. 8, 1985, Ser. No. 709,648

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—753 **6 Claims**

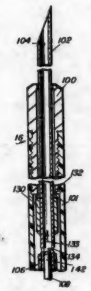
1. A completely flexible bronchoscopic needle assembly for

use with a flexible bronchoscope to obtain biopsy tissue samples from a patient, said assembly comprising:

an elongated flexible outer catheter having proximal and distal ends and defining an outer catheter cavity therebetween;

a hard tip including means for rigidly fixing said tip to said outer catheter distal end and means defining a bearing surface on the proximal end of said tip;

a hollow needle slideably and coaxially receivable in said tip and reciprocably moveable therein between a retracted position whereby said needle is retractably housed within said catheter to prevent inadvertent damage to said bronchoscope or said patient thereby and an extended position



whereby said needle is extended beyond the distal surface of said tip to permit the taking of biopsy tissue samples, said needle at its distal end defining a sharp edge for penetrating body tissue;

means connected to said needle for permitting reciprocal movement thereof between said retracted and extended positions;

limit means rigidly associated with said needle for contacting said bearing surface of said tip for establishing the extreme limit of said extended position; and

biasing means biasing said limit means into contacting relationship with said bearing surface to prevent retractable movement of said needle when in said extended position.

4,617,941

BLOOD COLLECTOR

Toshiji Ichikawa, Chofu, and Atsushi Shimizu, Tokyo, both of Japan, assignors to Terumo, Tokyo, Japan

Continuation-in-part of Ser. No. 613,746, May 23, 1984, abandoned, which is a continuation of Ser. No. 370,921, Apr. 22, 1982, abandoned. This application Aug. 6, 1984, Ser. No. 637,858

Claims priority, application Japan, May 20, 1981, 56-76311

Int. Cl.⁴ A61B *5/14*

U.S. Cl. 128—765 **9 Claims**

1. A blood collector comprising:

a blood collection container in the form of a tubular body defining a blood collection space, said tubular body having a forward end adapted for drawing blood therethrough into said collection container and having an open rear end;

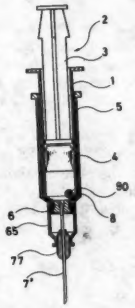
a closure unit movably mounted to said collection container for closing said rear end of said collection container and having a portion which contacts with blood collected in said collection container, said closure unit being adapted to apply a positive pressure of at least 3.1 kg/cm^2 to blood in said collection container when moved toward the tubular body forward end and a negative pressure of at least 1.3 kg/cm^2 to blood in said collection container when moved toward the tubular body rear end; and

valve means coupled to at least that portion of the closure unit which contacts with blood collected in said collection container, said valve means including:

a passage for passing air from said blood collection space to the exterior of said collection container; and

a filter cooperatively associated with said passage for allowing passage of air through said passage when blood is flowing into said collection container and for blocking said passage to both air and liquid so as to cut off communication of air and blood between said blood collection space and the exterior of said collection container when said collection container is filled with blood and said blood contacts said filter, said filter occupying the entire cross-section off at least part of said passage;

said filter comprising a sintered porous body of polyethylene having a starch-acrylonitrile graft copolymer incorporated therein, said polymeric material of said filter substantially instantaneously swelling upon contact with water of said blood to grow or expand in volume through absorption of the water content of said blood in



contact therewith so as to block the pores of said sintered body to block passage of both air and blood through said filter to thereby seal off and said passage and to prevent flow of both blood and air to and from said blood collection space through said passage, said sintered body providing a predetermined mechanical strength to said filter sufficient to withstand said positive and negative pressures applied by said closure unit, and said sintered body remaining substantially the same size even after said contact with said water of said blood and said swelling of said polymeric material; and

said polymeric material of said filter being sufficiently swellable upon contact with said water of said blood for not only preventing blood leakage under a positive pressure of up to about 3.1 kg/cm^2 applied by said closur unit toward the tubular body forward end, but also preventing air entry into the blood collection space under a negative pressure of up to about 1.3 kg/cm^2 applied by said closure unit toward the tubular body rear end.

4,617,942

CHAFF SPREADING APPARATUS

David L. Garner, Rte. 2, P.O. Box 516, Rupert, Id. 83350

Filed Jan. 24, 1985, Ser. No. 694,621

Int. Cl.⁴ A01F *29/02*

U.S. Cl. 130—27 R **7 Claims**

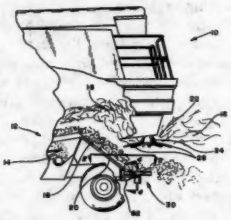
1. Apparatus for chopping and spreading straw and chaff, said apparatus adapted to be mounted to a combine harvestor threshing machine having

a straw and chaff exit chute; and

straw distributing means positioned adjacent said chute for distributing straw and chaff exiting said chute,

said apparatus comprising:

(a) at least one rotatable slightly dish-shaped wheel positioned for rotation adjacent and generally below said straw distributing means and generally below said exit chute, said wheel having a concave surface and a convex surface, and including a disk concentrically mounted to said wheel convex surface;



(b) a variable speed motor for driving said rotatable wheel; and

(c) at least one pair of blades mounted on said wheel concave surface generally transverse to the axis of rotation of said rotatable wheel, said blades being diagonally opposed from one another.

4,617,943

CIGARETTE MANUFACTURING MACHINE

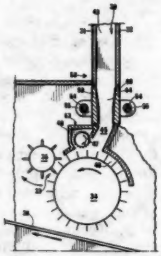
Riccardo Mattei, Bologna, Italy, assignor to G.D Societa' per Azioni, Bologna, Italy

Filed May 6, 1985, Ser. No. 730,990

Claims priority, application Italy, May 18, 1984, 3469 A/84

Int. Cl.[4] A24C *5/02*

U.S. Cl. 131—109.3 **8 Claims**



1. Cigarette manufacturing machine (1) comprising a shredded tobacco distributor (2), in turn, comprising a drop-down duct (30) for the said tobacco, means (23) for feeding the said tobacco into an inlet on the said duct (30), and means for withdrawing the said tobacco from an outlet on the said duct (30), characterised by the fact that the said duct (30) presents an intermediate portion (44) tapered towards the said outlet and comprising at least one flat wall (49 or 57 or 59,60) oscillating crosswise in its plane in relation to the travelling direction of the said tobacco in the said duct (30).

4,617,944

SAFETY CIGARETTE HOLDER IN A STACKABLE ASHTRAY

Istvan Gasparics, 622 W. Pender St., Vancouver, British Columbia, Canada, V6B 1V8

Filed Jul. 23, 1984, Ser. No. 633,491

Int. Cl.[4] A24F *19/14*

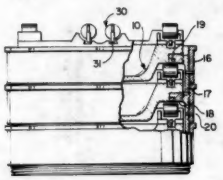
U.S. Cl. 131—235.1 **3 Claims**

1. The combination of an ashtray and a device for holding a cigarette on an ashtray, said device comprising two opposing, parallel, cylindrical cigarette-securing elements, the opposed surfaces of said cigarette-securing elements being spaced apart a distance less than the diameter of a cigarette, each said cigarette-securing element comprising:

(a) a supporting frame having a vertical member extending upwardly from and secured on said ashtray and a horizontal member extending from said vertical member;

(b) each said cylindrical element being a hollow cylinder of non-flammable material; and

(c) a means for supporting said cylinder substantially concentrically about said horizontal member comprising a piece of elastic material mounted within said hollow cylinder and mounted on said horizontal member, wherein at least two portions of said piece of elastic material bear against the interior surface of said hollow cylinder;



whereby when a cigarette is aligned horizontally and parallel to said cigarette-securing elements and is pressed between said hollow cylinders, said hollow cylinders bear against the sides of said cigarette and are displaced outwardly, deforming said elastic pieces, until the widest part of said cigarette passes below the narrowest point between said hollow cylinders, and said elastic pieces cause said hollow cylinders to return inwardly and bear downwardly on said cigarette, thereby securing said cigarette on said ashtray.

4,617,945

PROCESS FOR FLAVORING TOBACCO

Cornelis Vos, and Jan Brasser, both of Huizen, Netherlands, assignors to Naarden International N.V., Naarden-Bussum, Netherlands

Filed Jun. 24, 1983, Ser. No. 507,787

Claims priority, application Netherlands, Oct. 14, 1982, 8203963

Int. Cl.[4] A24B *15/00*

U.S. Cl. 131—310 **16 Claims**

1. A process for flavoring dry cut tobacco by means of at least one micro-encapsulated flavor, comprising the steps of separately mixing the tobacco with the micro-encapsulated flavor and with an aqueous adhesive solution in an amount sufficient to provide adhesion of the micro-encapsulated flavor to the tobacco and containing such quantity of water that said quantity may at least be substantially absorbed by the tobacco, and continuing the mixing operation till a free-flowing mixture is obtained.

4,617,946

TOBACCO SMOKE MOUTHPIECE AND METHOD OF MAKING SAME

Charles H. Keith, Charlotte, N.C., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

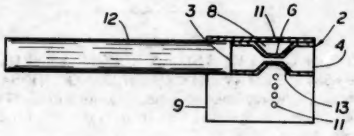
Filed Nov. 9, 1984, Ser. No. 670,109

Int. Cl.[4] A24B *3/04*

U.S. Cl. 131—336 **10 Claims**

1. An improved tobacco smoke mouthpiece comprising: a longitudinally extending assembly of structurally sturdy forming material shaped and disposed to include spaced, opposed, axially aligned open-ended tobacco smoke inlet and outlet chambers and at least on mixing chamber disposed therebetween with said opposed inlet and outlet chambers being communicably connected to each other through axially disposed

capillary passage means; an enveloping tipping material surrounding said chambers; and aperture means in said tipping material and said chamber forming material to allow ready



passage of smoke diluting air through said tipping material into said mixing chamber and through at least one of said opposed communicably connected chambers.

4,617,947

CHIN SUPPORT BELT

Mary A. Clarke, 28887 Ave 15 1/2, Madera, Calif. 93638

Filed Sep. 12, 1984, Ser. No. 650,281

Int. Cl.[4] A45D *44/00*

U.S. Cl. 132—1 R **9 Claims**

1. An apparatus for supporting the chin of a subject of the type to be suspended from a unit located above the subject's chin, said apparatus comprising:

an elongated member comprised of a substantially flexible material having a pair of spaced apart tapered protrusions, each of said protrusions having a narrow end and a wide end and arranged along said elongated member such that the narrow ends are proximal to one another and separated by a distance substantially corresponding to the width of the subject's chin; and

means for suspending said elongated member from the unit.

4,617,948

MAKE-UP UNIT, FOR EYELASHES IN PARTICULAR

Jean-Louis H. Guéret, Paris, France, assignor to L'Oreal, Paris, France

Filed Jul. 6, 1983, Ser. No. 511,202

Claims priority, application France, Jul. 7, 1982, 8211922; Jun. 27, 1983, 8310565

Int. Cl.[4] A45D *40/30*

U.S. Cl. 132—88.5 **7 Claims**

1. A make-up unit comprising

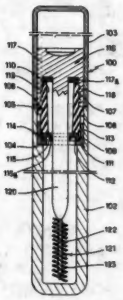
(a) a reservoir for a fluid or pasty make-up product, said reservoir comprising a container having an inner wall and a step formed integrally on said inner wall with a retainer ring seated on said step, said retainer ring having a wall portion engaging the inner wall of said container, said inner wall above said step having a thickness smaller than the thickness of the remainder of said inner wall;

(b) a detachable cap fitted on said reservoir;

(c) a stem integral with said cap and disposed substantially along the axis of said cap and projecting in relation to the said cap;

(d) a brush carried by the step in the extension of the stem, said brush comprising an axial core formed from a metal wire folded back on itself, the resulting doubled wire being twisted so as to provide a helical arrangement of substantially radial bristles, the diameter of said brush being about 3 mm, said metal wire having a diameter of from about 0.40 mm to about 0.45 mm and said stem having a diameter of about 3 mm; and

(e) a wiper device having a lip bounding a substantially circular opening to receive said brush as it is inserted into said reservoir, the diameter of said opening being from about 1.5 mm to about 2.1 mm, said wiper device being



disposed between the reservoir and a wiper holder fixed to said reservoir, said wiper holder engaging a portion of said retainer ring and having an insertion duct having an upwardly flaring frustoconical shape whose longitudinal axis is substantially identical with the axis of said circular opening through which said brush penetrates during insertion into said reservoir, the diameter of said insertion duct in the zone adjacent to said wiper device being from about 3.2 mm to about 4 mm, said wiper device being made of an elastomeric material and having said lip pliable and elastically deformable to define said circular opening with an external diameter which is clearly smaller than the outer diameter of said brush and is slightly greater than the diameter of the core of said brush.

4,617,949

SCALP APPLICATOR

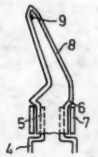
Ernest Hofmann-Igl, Kampen auf Sylt, Fed. Rep. of Germany, assignor to Basotherm GmbH, Biberach an der Riss, Fed. Rep. of Germany

Continuation of Ser. No. 344,555, Feb. 1, 1982, abandoned. This application Oct. 11, 1984, Ser. No. 659,653

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1981, 3105802

Int. Cl.[4] A45D *40/30*

U.S. Cl. 132—88.5 **5 Claims**



2. A scalp applicator means for applying liquid to the scalp comprising a hollow body and an applicator means, wherein

said applicator means comprises two forked prongs having at least at their ends a cross-section comprising a square with rounded edges, each of which prongs has at its end at least one outlet or spray opening; the outlets or spray openings on each prong are positioned laterally on the sides of the prongs away from each other and are arranged in an edge of each prong near the scalp on a diagonal basis in the rounded portion of the edge; and the prongs terminate in a flat surface in order to form skids, whereby the location of the openings precludes clogging of the openings by flakes of skin from the scalp.

4,617,950

GINGIVAL RETRACTION CORD WITH WET, DRIP-FREE ASTRINGENT

Don D. Porteous, Los Angeles, and Paul M. Wittrock, Van Nuys, both of Calif., assignors to Van R Dental Products, Inc., Los Angeles, Calif.

Filed Apr. 22, 1985, Ser. No. 725,489

Int. Cl.[4] A61C *15/00*

U.S. Cl. 132—91 **34 Claims**

1. Drip-free, astringent gingival retraction cord providing immediately available astringent effect in the sulcus without requirement of solvation by sulcus liquids, the cord comprising a suitably dimensioned cord structure, and a bodied astringent salt solution atop the cord structure.

4,617,951

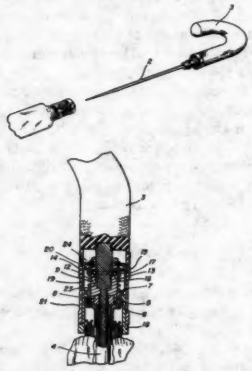
WEAPON CONCEALMENT AND LOCKING MEANS

William C. Adams, Lithonia, and William J. Taylor, Decatur, both of Ga., assignors to Atlanta Cutlery Corporation, Conyers, Ga.

Filed Aug. 12, 1985, Ser. No. 764,387

Int. Cl.[4] A45B *3/14, 9/02, 23/00*

U.S. Cl. 135—66 **8 Claims**



1. Weapon concealment and locking means comprising an elongated tube, a weapon disposed in said elongated tube a ferrule affixed to one end of said elongated tube, said ferrule comprising a first locking means, said first locking means being spring biased and comprising at least one pin receiving slot formed in said ferrule, said spring biased locking means further comprising a pin disposed in said slot, an abutment surface formed on said ferrule and being spaced from said slot and disposed perpendicular to the axis of said elongated tube, a spring disposed in enveloping relationship around said ferrule and between said abutment surface and said pin, a washer disposed between said pin and the adjacent end of said spring, a sleeve coaxially disposed with respect to said elongated tube and in substantially enveloping relationship with respect to said ferrule and said spring, a collar formed on the upper edge of said sleeve and extending inwardly therefrom, the lower surface of said collar being in face contacting relation with respect to the upper surface of said washer during compression of said spring, and a second locking means being formed on said weapon and being adapted to cooperate with said first locking means for releasably retaining said weapon within said elongated tube.

4,617,952

SWITCHING VALVE AND AN ELECTRO-PNEUMATIC PRESSURE CONVERTER UTILIZING THE SAME

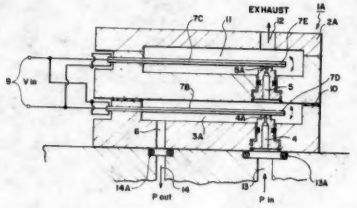
Masatoshi Fujiwara, Yokosuka, and Masato Kuroda, Fujisawa, both of Japan, assignors to Yamatake-Honeywell Co. Limited, Tokyo, Japan

Filed Jul. 18, 1985, Ser. No. 756,198

Claims priority, application Japan, Jul. 31, 1984, 59-116031[U]; May 10, 1985, 60-98063

Int. Cl.[4] F16K *31/02*

U.S. Cl. 137—85 **5 Claims**



1. An electric-pressure converter comprising

a sealed chamber,

a switching valve having at least one plate-shaped electric current deformable element mean having at least one free end which is supported in said sealed chamber,

at least two pressure injection nozzles arranged to be opened or closed due to a position of said free end of said element means, and

an output passage communicating outwardly from said sealed chamber,

means for converting the air pressure signal routed from said output passage into a regulated air pressure signal,

a pressure sensor for converting the pressure signal from said means for converting into an electrical signal,

pulse-width modulating means for providing a pulse-width modulating signal which corresponds to the deviation between the electrical signal from said pressure sensor and

an external electric reference signal for energizing said plate-shaped electric current deformable element means in said switching valve.

4,617,953

FLUID FLOW CONTROL SYSTEM

Michael W. Kendall-Tobias, 3 Greenfield Ave., Danbury, Conn. 06810

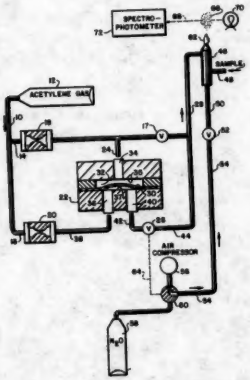
Filed Nov. 13, 1984, Ser. No. 670,714

Int. Cl.[4] F16K *7/12*

U.S. Cl. 137—110 **11 Claims**

1. A fluid flow control system comprising a common source connection for a fluid under pressure, a master fluid flow path connected to receive fluid from said common source connection, at least one slave fluid flow path connected to receive fluid from said common source connection, a first valve means connected in said master path for controlling the rate of fluid flow therein, means operable to maintain the rate of fluid flow in said slave path at a predetermined relationship to the rate of flow in said master path comprising a first orifice device connected in said master path between said common source connection and said first valve means, said slave path including a pressure responsive fluid flow modulating means connected in series therein and having a control connection to said master

path between said first orifice device and said first valve means, a second orifice device connected in said slave path between said common source connection and said flow modulating means, said first and second orifice devices each being operable to provide pressure drops in response to fluid flow as measures of fluid flow through said master and slave paths respectively, said flow modulating means being operable in response to the fluid pressure in said master path as reduced by said first orifice device as detected through said control connection and operable in response to the fluid pressure in said slave path as reduced by said second orifice device to control the fluid flow through said slave path and the resultant pressure drop through said second orifice device to maintain a predetermined relationship of the fluid flow through said slave path to the fluid flow through said master path by maintenance of a predetermined relationship between the fluid pressures in



said master and slave paths as detected at said modulating valve;

said flow modulating means being operable to maintain a predetermined relationship between said master and slave path fluid pressures which consists of a substantially constant ratio between said pressures, the constant ratio being one to one;

said first and second orifice devices having substantially equal sized orifices to provide for substantially equal pressure drops in response to equal fluid flows;

the downstream end of said master path beyond said first valve means being connected in common to the downstream end of said slave path beyond said flow modulating means to a common delivery connection, and a second valve means connected in said slave path which is operable to shut off all flow from said slave path when slave path flow is not required.

4,617,954

VALVE ASSEMBLIES

Nigel J. Petts, Chorley, and John Marsh, Penwortham, both of England, assignors to Dobson Park Industries Plc., Nottingham, England

Filed Mar. 13, 1984, Ser. No. 589,488

Claims priority, application United Kingdom, Mar. 26, 1983, 8308382

Int. Cl.[4] F15B *13/042*

U.S. Cl. 137—110 **14 Claims**

1. A valve assembly for use with a hydraulic mine roof support, said valve assembly comprising a generally rectangular valve body, said valve body including:

first and second side faces, and first and second ends;

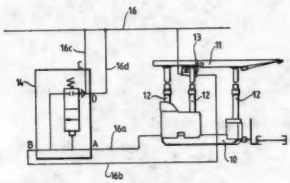
a main supply passage extending through said valve body in a straight line from said first end of said valve body to said second end of said valve body, parallel to said first and second side faces;

an outlet end of said main supply passage, said outlet end being connected in use to a hydraulic mine roof support.

an inlet end of said main supply passage, said inlet end being connected in use to a main control valve for supplying hydraulic fluid under pressure to said hydraulic mine roof support;

a bypass supply passage having an inlet portion extending parallel to said main supply passage, said inlet portion being connected in use to a source of hydraulic fluid under pressure, and an outlet portion extending at right angles to said inlet portion, connecting said inlet portion to said main supply passage intermediate the ends thereof;

a non-return valve contained in said inlet portion of said bypass supply passage;



a bore extending from said first side face of said valve body, parallel to said outlet portion of said bypass supply passage, intersecting said inlet portion of said bypass supply passage and communicating with said main supply passage;

pressure sensitive valve means mounted in said bore and defining a valve chamber positioned where said bore intersects said inlet portion of said bypass supply passage;

a pressure sensitive valve member working in said valve chamber having a face exposed to the pressure in said main supply passage, so that when the pressure in the main supply passage rises above a pre-determined limit, the pressure acting on said face moves said valve member in said valve chamber, connecting said inlet portion of said bypass supply passage to said outlet portion of said supply passage, to permit hydraulic fluid under pressure to flow through said pressure sensitive valve means to said main supply passage.

4,617,955

STOP OR SWITCH VALVE FOR FLUIDS

Oluf Melgaard, Odder, Denmark, assignor to BM Digiflow A/S, Odder, Denmark

PCT No. PCT/DK83/00111, § 371 Date Jul. 30, 1984, § 102(e) Date Jul. 30, 1984, PCT Pub. No. WO84/02168, PCT Pub. Date Jun. 7, 1984

PCT Filed Nov. 28, 1983, Ser. No. 638,486

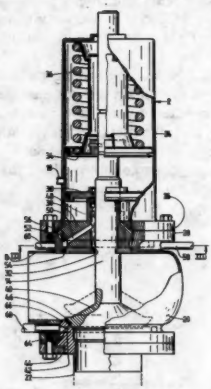
Claims priority, application Denmark, Nov. 29, 1982, 5294/82

Int. Cl.[4] B08B *9/02*; F16K *51/00, 1/44*

U.S. Cl. 137—240 **8 Claims**

1. A stop or switch valve for fluids, the valve comprising a valve chamber including an inlet, outlet or throughlet chamber having in a wall portion thereof, a valve seat opening communicating with a branch conduit, and a valve head for opening and closing said valve seat opening by a respective displacement movement away from or towards the valve seat opening, the valve head being connected with a guiding or driving rod member axially reciprocated through a sealing opening in an opposite wall portion of said valve chamber, such that the rod member traverses the valve chamber and is thus exposed to the fluid therein, characterized in that a stationary bushing is arranged for closing and sealing said chamber and surrounds the rod member, the stationary bushing having an interior annular recess opening inwardly towards an outer surface of the rod member and communicating with channel means for supplying

the recess with a medium such as a cleansing or sterilizing medium for cleaning the outer surface of the rod member in all positions of the valve head to prevent the fluid in said chamber from becoming contaminated as a result of the rod member



reciprocating back and forth into said chamber, said annular recess having an axial length at least roughly corresponding to the valve head displacement between open and closed positions thereof.

4,617,956

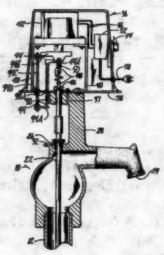
CONTROL MEANS FOR GROUND HYDRANTS

Otto H. Sievers, 811 E. Milwaukee, Storm Lake, Iowa 50588

Continuation-in-part of Ser. No. 531,480, Sep. 12, 1983, abandoned. This application Dec. 31, 1985, Ser. No. 815,379

Int. Cl.[4] F16K *31/02*; E03B *9/04*

U.S. Cl. 137—272 **3 Claims**



1. In combination with a freezeless ground hydrant having an elongated vertical housing, a valve means at the bottom of said housing adapted to be in communication with a source of water under pressure, a drain means adjacent said valve means so that water in said hydrant above said valve means will drain from said housing when said valve means is in a closed position, the bottom of said housing normally dwelling in the ground below the frost level, and the upper end of said housing dwelling above the ground level, a water exit port at the upper end of said housing in communication with said valve means to permit the flow of water through and from said hydrant when said valve means is open, an actuating rod attached to said valve means and extending upwardly through said housing to the upper end thereof, the invention comprising,

an electrical solenoid means on the upper end of said housing adapted to be connected to a source of electrical energy, said solenoid means having a moveable plunger,

linkage means connecting said moveable plunger and said actuating rod to raise said actuating rod to open said valve means when said solenoid means is electrically energized,

an electrical timer being electrically imposed between said solenoid means and said source of electrical energy so that said solenoid means can be periodically and intermittently energized,

a spring means having upper and lower ends with its upper end being directly secured to said plunger; said spring means extending downwardly from said plunger in a direction parallel to said actuating rod and moveably extending through said housing with the lower end thereof dwelling outside said housing.

a threaded rod adjustably mounted on said housing and being positioned adjacent to and parallel to said spring means, said threaded rod having upper and lower ends,

a horizontal bar adjustably secured to the lower end of said threaded rod and moveably along the axis of said threaded rod,

the lower end of said spring means being directly connected to said horizontal bar to permit a variable tension in the spring means upon the adjustment of said horizontal bar, and

said spring means adapted to lower said actuating rod to close said valve means when said solenoid means is not electrically energized.

4,617,957

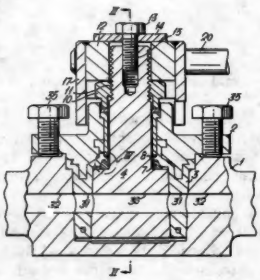
ROTARY PLUG VALVE

Michael J. Sandling, Barnstaple, England, assignor to Xomox Corporation, Cincinnati, Ohio

Filed Jul. 25, 1983, Ser. No. 516,977

Int. Cl.[4] F16K *43/00, 29/00*

U.S. Cl. 137—315 **13 Claims**



9. In a rotary plug valve comprising a housing having a body provided with an inlet port and an outlet port respectively for the inlet and outlet of fluid and defining therein a frusto-conical chamber having a tapered side wall through which said ports communicate; a liner within said chamber, said liner being formed of compressible material, said liner having apertures therethrough aligned with said ports; a frusto-conical plug sealingly received within said liner and having a flow passage therethrough; and means for rotati,ng said plug from exteriorly of said housing between a valve-open position and a valve-closed position in which, respectively, said passage provides communication between said apertures aligned with said ports and said plug blocks said communication; the improvement wherein said frusto-conical plug has a tapered side wall which is tapered in a direction opposite to the direction of taper of said tapered side wall of said chamber, means is provided for moving said plug axially relative to said body to control the degree of compression of said liner between said tapered side wall of said plug and said tapered side wall of said chamber, said housing comprises a removable cover portion having an opening therethrough, said plug has an extension portion extending through said opening and comprises said means for

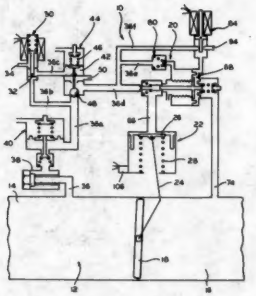
rotating said plug, an annular space is provided between said plug extension portion and said cover portion, an abutment is provided on said housing cover portion, a thrust ring is received within said annular space, and said means for moving said plug axially comprises a nut threaded to said plug extension and engageable via said thrust ring with said abutment, whereby upon rotation of said nut, said thrust ring is forced against said abutment drawing said plug linearly to thereby compress said liner.

4,617,958

CONTROL VALVE

William E. Seidel, Rockford; Albert L. Markunas, Roscoe, and Thomas A. Nelson, Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 25, 1985, Ser. No. 758,760
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—492.5 20 Claims



1. A control valve for supplying a fluid under pressure to a fluid operated system, comprising:

a fluid passageway including an inlet communicating with a source of said fluid and an outlet communicating with said system;

valve means disposed in said fluid passageway between said inlet and outlet, said valve means being movable between open and closed positions, said valve means being in a closed position prior to start-up of said system;

a pilot operated valve member responsive to fluid pressure on said inlet and outlet sides of said valve means; and

actuator means adapted for communication with said fluid passageway on said inlet side of said valve means through said pilot operated valve member, said actuator means being operable to move said valve means between said closed position and said open position, said actuator means moving said valve means dependent upon said fluid pressure on said inlet and outlet sides of said valve means;

said pilot operated valve member including means for limiting the rate of increase in fluid pressure toward an operating pressue on said outlet side of said valve means during start-up of said system, means for adjusting said pressure on said outlet side of said valve means to change the speed of said system during operation thereof, and means for limiting said fluid pressure on said outlet side of said valve means to said operating pressure during operation of said system;

said pilot operated valve member including an axially movable poppet, said fluid pressure on said inlet side of said valve means biasing said poppet from a closed position to an open position, said pilot operated valve member also including a diaphragm assembly axially spaced from said poppet;

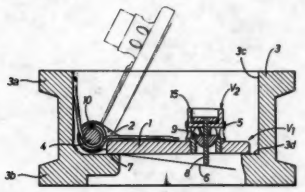
said diaphragm assembly including at least one chamber in communication with said fluid pressure on said outlet side of said valve means, said chamber being arranged such that said fluid pressure on said outlet side of said valve means biases said poppet toward said closed position, said diaphragm assembly and chamber comprising at least a portion of said pressure limiting means.

4,617,959

CHECK VALVE ASSEMBLY FOR PIPELINE SYSTEM

Yutaka Yamada, 42, 2-chome, Komenoza-cho, Tsushima-shi, Aichi-ken, Japan, assignor to Nippondenso Co., Ltd., Kariya and Yutaka Yamada, Tsushima, both of, Japan

Filed Oct. 4, 1985, Ser. No. 783,993
Int. Cl.[4] F16K *15/03*
U.S. Cl. 137—512.1 4 Claims



1. A check valve assembly of the quick shutoff type equipped with an auxiliary valve of the slow closure type,

wherein said check valve assembly comprises a valve housing formed therein with a primary cylindrical bore; a primary valve plate arranged within said valve housing to open and close said primary cylindrical bore; and a swingable pressure receiving plate secured at one end thereof to said primary valve plate to be applied with a hydraulic pressure at the upstream of said primary valve plate; and

wherein said auxiliary valve comprises a cylindrical valve casing mounted on a portion of said primary valve plate to be located at the downstream of said primary valve plate, said valve casing being formed therein with a secondary cylindrical bore and formed at the peripheral wall thereof with a radial port which is arranged at the downstream of said primary valve plate to permit the flow of hydraulic fluid passing therethrough; a cup-shaped cylinder coupled with one end of said valve casing; a piston slidably disposed within said cup-shaped cylinder to form a chamber in said cylinder; flow restriction means arranged to provide a fluid communication between said chamber and the interior of said valve casing; a valve element slidably disposed within said valve casing to control the quantity of hydraulic fluid flowing through said secondary cylindrical bore and said radial port; and a valve rod arranged to interconnect said piston and said valve element and being engaged at one end thereof with said pressure receiving plate.

4,617,960

VERIFICATION OF A SURFACE CONTROLLED SUBSURFACE ACTUATING DEVICE

Henry S. More, Los Altos, Calif., assignor to Develco, Inc., Sunnyvale, Calif.

Filed May 3, 1985, Ser. No. 730,705
Int. Cl.[4] F16K *37/00*
U.S. Cl. 137—554 9 Claims

1. A subsurface actuator verification system, comprising:

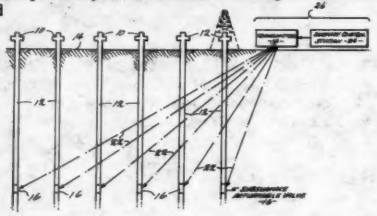
an actuating device adapted for subsurface installation;

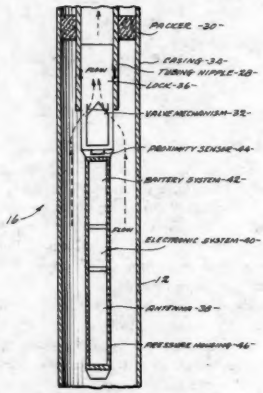
means for transmitting a signal from the earth's surface for controlling an operational state of said device when it is installed subsurface;

means, adapted to be installed proximate said device, for receiving said signal transmitted from the earth's surface and controlling an operational state of said subsurface-installed device in accordance therewith;

means for detecting an actual operational state of said device and generating state data indicative thereof;

means, in proximity to said device, for storing said state data; and





means for reading out said data from said storing means upon removal of said device from its subsurface installation enabling a comparison of data from said storage means with information indicative of said signal previously transmitted from the earth's surface.

4,617,961

PILOT-OPERATED SOLENOID VALVE APPARATUS

Wolfgang Lichtenberg, Hanover, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Dec. 7, 1984, Ser. No. 679,338

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345697

Int. Cl.[4] F15B *13/043*

U.S. Cl. 137—596.16 **11 Claims**

1. A fluid-pressure-operated, pilot-controlled solenoid valve apparatus for regulating the flow of fluid pressure in a fluid pressure consumer, said solenoid valve apparatus comprising:

(a) a valve housing having formed therein an entrance chamber and an exit chamber in fluid communication with an outlet port;

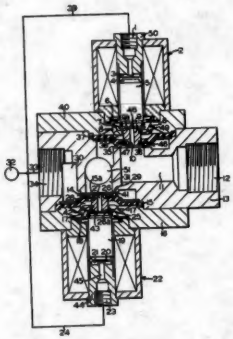
(b) inlet valve means disposed within said valve housing intermediate said entrance chamber and said exit chamber for allowing fluid pressure to flow from said entrance chamber to said exit chamber when in an open condition, said inlet valve means including a diaphragm element movable between such open condition and a closed condition;

(c) an annular sysmmetric body disposed on said diaphram element having a longitudinal bore formed therein;

(d) an inlet control valve having a lower valve seat formed by a portion of said annular sysmmetric body and a control valve body which, when in contact with said lower valve seat, blocks said longitudinal bore and closes said inlet control valve;

(e) a control chamber formed in said valve housing adjacent one side of said diaphram element, said control chamber being in fluid communication with said exit chamber when said inlet control valve is in an opened condition;

(f) pilot valve means disposed in said valve housing adjacent said inlet control valve for opening said inlet control valve when selectively activated, said pilot valve means including a spring-biased pilot valve body which is urged toward said control chamber when said pilot valve means is deactivated thereby closing said inlet control valve, said control valve body and said pilot valve body being formed



on opposite ends of a valve anchor member in such a manner that said inlet control valve and said pilot valve means are simultaneously operated to alternate open and closed positions thereby, such open position of said pilot valve means being effective such that, fluid pressure substantially equivalent in pressure value to that present in said entrance chamber, flows around said valve anchor member and into said control chamber; and

(g) a discharge chamber formed in said valve housing adjacent said exit chamber and an outlet valve means formed in said valve housing intermediate said exit chamber and said discharge chamber for exhausting, when in an open condition, fluid pressure present in said exit chamber, said outlet valve means including a second diaphragm element movable between an open and a closed position.

4,617,962

HYDRAULIC DEVICE

Rudolf Brunner, Baldham, Fed. Rep. of Germany, assignor to Heilmeier & Weinlein Fabrik fur Oel-Hydraulik GmbH & Co., KG, Munich, Fed. Rep. of Germany

Filed Sep. 12, 1984, Ser. No. 649,684

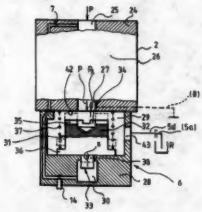
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1983, 3333967

Int. Cl.[4] F15B *21/04*; F16K *47/02*

U.S. Cl. 137—613 **18 Claims**

1. A hydraulic device comprising at least one adjustable working control or regulating member (2) which is arranged between a high pressure source (P) and an outflow path (43) and is movable into at least one position in which a jet is formed via a passage intersecting said outflow path, characterized in that at least one jet disturbing means (6) having a jet disturbing element (31) is arranged adjacent the intersection of said passage and said outflow path, said jet disturbing element being movable between a ready position free of the intersection into a disturbing position at the intersection of said passage and said outflow path, means biasing said element to its ready

position so that said passage is normally undisturbed by the influence of said element, said jet disturbing element having a jet disturbing face (32) being movable with the jet disturbing element into the jet, means for applying an adjusting force to the element to displace the element from ready position which displacement in distance depends on and varies with the pressure of said high pressure source, means constantly maintaining an open connection between said passage and said outflow path regardless of the distance the adjusting force displaces the



element from its ready position, biasing means returning said element to said ready position as soon as the pressure from said high pressure source approximately has dropped to the pressure in said outflow path , and further characterized in that in said outflow path (R) behind said jet disturbing means (6) at least one further similar jet disturbing means (6', 6'', 6''') is arranged, the jet disturbing element thereof being adjustable from its ready position in dependence of the pressure before the preceding jet disturbing means (6, 6', 6'').

4,617,963

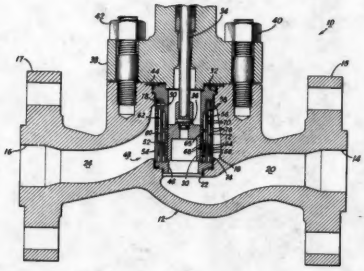
CONTROL VALVE WITH ANTICAVITATION TRIM

James A. Stares, Norton, Mass., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Continuation of Ser. No. 507,064, Jun. 23, 1983, abandoned. This application Jul. 18, 1985, Ser. No. 756,567

Int. Cl.[4] F16K *47/08*; F15D *1/00*

U.S. Cl. 137—625.3 **17 Claims**



1. A valve comprising:

a. a valve body with a fluid inlet and a fluid outlet,

b. a valve seat ring positioned in said valve body between said fluid inlet and said fluid outlet,

c. a valve plug reciprocally mounted in said valve body and engaging said valve seat ring in a valve closed mode,

d. a first cage member positioned in said valve body having two ends, a plurality of apertures, and a plurality of radially extending fins disposed over only one end of said first cage,

e. a second cage member positioned in said valve body adjacent said first cage member and having two ends, a plurality of apertures adjacent only each end of said second cage member, and a plurality of radially extending fins over only one portion of the length of said second cage member,

f. a third cage member positioned in said valve body adjacent said second cage member and having two ends, and a plurality of apertures adjacent only one end of said third cage member, and

g. said cage members being positioned in said valve body to define substantially continuous axial, circumferential and radial flow passages between adjacent cage members which flow passages vary with the position of said plug from its closed mode.

4,617,964

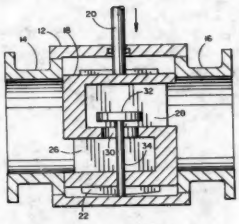
TIGHT SHUT-OFF VALVE WITH FLOW CONTROL

Gordon M. Smith, La Habra Heights, Calif., assignor to Johnston Pump/General Valve, Inc., Glendora, Calif.

Filed Oct. 28, 1985, Ser. No. 791,748

Int. Cl.[4] F16K *5/10*

U.S. Cl. 137—625.3 **6 Claims**



1. A seat and reseat valve of the type including a valve body having a rotatable plug for aligning a flow passge in the plug with an inlet and outlet when the valve is opened and for blocking the inlet and outlet with retractable slips connected to the plug when the valve is closed; the valve comprising:

an inlet channel and an outlet channel in said plug, said channels being separated by a flow control passage; and

a flow control element fixed relative to said valve body and positioned adjacent said flow control passage whereby to control flow through said valve in response to movement of said plug.

4,617,965

CONTROL INSERT FOR SANITARY MIXER VALVES

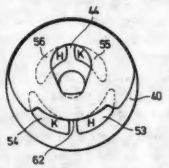
Werner Lorch, Schramberg, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany

Filed May 6, 1985, Ser. No. 730,804

Claims priority, application Fed. Rep. of Germany, May 23, 1984, 3419208

Int. Cl.[4] F16K *11/078*

U.S. Cl. 137—625.17 **19 Claims**



19. A sanitary mixer valve with a fixed control surface connectable to water inlet ports of the valve, the fixed control surface having at least one opening zone for cold water and at least one opening zone for hot water, a control surface movable with respect to said fixed control surface with two degrees

of freedom, a mixer lever attached to the movable control surface for controlling quantity and mixing ratio between the opening zones and at least one out port as a function of position, and wherein:

the fixed and movable control surfaces define at least two separable mechanically coupled controlled mixing flow paths.

4,617,966

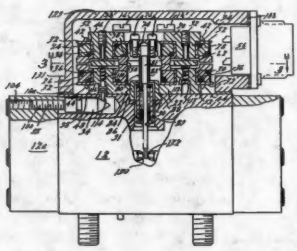
ELECTROMAGNETIC POSITIONER FOR A SERVOVALVE OR THE LIKE

Robert D. Nicholson, Birmingham, Mich., assignor to Bardle Servovalve Co., Birmingham, Mich.

Division of Ser. No. 557,360, Dec. 1, 1983, Pat. No. 4,560,969. This application Jul. 15, 1985, Ser. No. 755,154

Int. Cl.⁴ F15B *13/043*

U.S. Cl. 137—625.62 **3 Claims**



1. An electromagnetic positioner and pilot valve assembly,

said positioner having electromagnetic means selectively energizable in response to an incoming signal, a magnetizable armature pivotally movable in response to an incoming signal to a position corresponding to the direction and strength of said signal,

and a drive arm pivotally movable about a horizontal axis in response to and in correspondence with movement of said armature,

said pilot valve assembly including a valve body and movable hydraulic flow control means mounted therein responsive to movement of said drive arm to mimic movement thereof and assume under null conditions a position in which said rate and direction of flow of hydraulic fluid is coincident with the position assumed by said armature in response to a said incoming signal, and null adjusting means positioned in part in said valve body and in part within said positioner, and operable to adjust the position of said armature to increase or decrease said flow rate and bring it into coincidence with the direction and strength of said signal, said null adjusting means includes a driving element movably mounted within the valve body, a driven element movably mounted in the positioner, said driven element comprising a push-rod which is unsupported within said positioner body except when engaged by said driving element and means including an element projectable into holding engagement with said push-rod prior to assembly of the positioner and valve bodies for preventing escape of said push-rod until said assembly has been completed.

4,617,967

TWO-STAGE HYDRAULIC VALVES

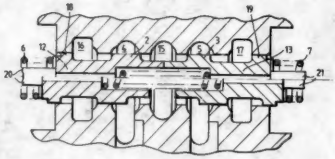
John I. Read, Chichester, and Raymond T. Roderick, Portsmouth, both of England, assignors to Vickers, Incorporated, Troy, Mich.

Filed Dec. 13, 1983, Ser. No. 561,031

Claims priority, application United Kingdom, Dec. 13, 1982, 8235516

Int. Cl.⁴ F15B *13/043*

U.S. Cl. 137—625.64 **4 Claims**



1. Electrically operated two-stage hydraulic spool valve comprising a main stage having a main spool, centring springs acting on said main spool, a pilot stage having a pilot spool, and at least one solenoid acting on an end of said pilot spool to control the operating position of the latter, said pilot stage comprising a tank port, two supply ports and two service ports, said tank port being disposed between said service ports and said service ports being disposed between said supply ports, said pilot spool comprising two parts, a spring interposed between said parts and urging said two parts apart in a direction axially of said pilot spool so that on deenergisation of the solenoid, said parts of said pilot spool separate under the action of said spring to provide an interconnection between said pilot service ports and said tank port.

4,617,968

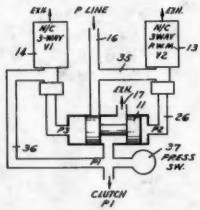
ELECTROHYDRAULIC CONTROL OF A SPOOL VALVE FOR ENERGIZING A HEAVY DUTY AUTOMATIC TRANSMISSION CLUTCH

John Hendrixon, Shelby, Mich., assignor to Sealed Power Corporation, Muskegon, Mich.

Filed Apr. 4, 1985, Ser. No. 719,898

Int. Cl.⁴ F15B *13/043*

U.S. Cl. 137—625.64 **6 Claims**



1. An electrohydraulic control system comprising

a spool valve including a body having a bore,

a spool positioned in the bore for reciprocating movement within the bore,

said valve body having an inlet, an outlet and an exhaust port intersecting said bore,

said spool being operable to selectively control the flow of fluid from said inlet to said exhaust, and said outlet,

an electrohydraulic three-way normally closed pulse width modulated valve having an inlet communicating with the inlet to said valve body and an outlet communicating with one end of said spool,

an electrohydraulic three-way normally closed ON/OFF valve having an inlet communicating with the outlet of

said body and an outlet communicating with the other end of said spool.

4,617,969

ACTUATING DEVICE FOR TWO MUTUALLY DEPENDENTLY ACTUABLE VALVES

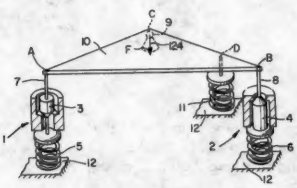
Günter Weiger, Esslingen; Dieter Dörrie, Plochingen, and Paul Schwerdt, Freudenstadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 675,003

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342951

Int. Cl.⁴ F15B *13/044*

U.S. Cl. 137—627.5 **4 Claims**



1. An apparatus for actuating a pair of valves in sequence, the apparatus comprising:

a housing,

a first and second valve mounted in the housing for movement in relation thereto, the first valve including a first tappet and a first spring means for yieldably biasing the first valve toward a normal position, the second valve including a second tappet and a second spring means for yieldably biasing the second valve toward a normal position,

an actuating member,

means for mounting the actuating member within the housing to selectably engage the first tappet, the second tappet, and a bearing point member fixed to the housing to lie on a line other than a line joining the two valve tappets,

an actuator spring means for yieldably biasing the actuating member toward a normal position, the actuator spring means being situated intermediate a portion of the housing and the actuating element and in proximity to the second tappet, and having a spring force greater than the certain spring forces of each of the first and second spring means, and

an adjusting member for tilting the actuating member to sequentially actuate the first and second valves, the actuating member being tiltable during a first adjustment stroke counter to the force of the first valve spring about a first axis of rotation (C-D) defined by the bearing point (C) fixed to the housing and by the compression spring in order to actuate the first valve and move the first tappet to a selected position, the actuating member being tiltable during a second adjustment stroke counter to the force of the compression spring about a second axis of rotation (C-A) defined by the bearing point fixed to the housing and by the moved first tappet in order to actuate the second valve.

4,617,970

FLUIDIC SENSOR OF OBJECTS

Ferdo A. Sivov, Sofia, Bulgaria, assignor to Institute po Mebeli I Obzavejdane, Sofia, Bulgaria

Filed Apr. 26, 1985, Ser. No. 727,863

Int. Cl.⁴ F15C *4/00, 3/00*

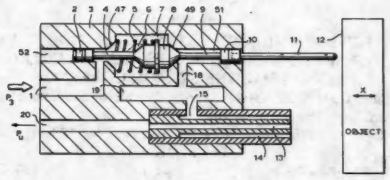
U.S. Cl. 137—805 **4 Claims**

1. A fluidic sensor of objects comprising a body in which there are mounted an emitting nozzle, connected to a feeding chamber; said feeding chamber being connected to a feeding conduit; and

an intake nozzle, coaxially disposed in the area defined by the emitting nozzle and connected to an outlet conduit; wherein between the inlet conduit and the feeding chamber there is, shaped in the body, an additional chamber with conical ends, inside which additional chamber there is disposed a movable valve body with conical seats shaped on opposite ends; said valve body connected to a switching sensor movably mounted in the body;

a front guide conduit and a rear guide conduit extending from the conical ends of the additional chamber;

a front guide movably disposed within said front guide conduit;



and a rear guide movably disposed within said rear guide conduit;

each of said guides being connected to said valve body by means of an axle;

said axles, guides, and valve body being provided with a common longitudinal conduit;

said switching sensor being rigidly fastened to said front guide by means of a threaded joint, and said switching sensor being provided with a similar common longitudinal conduit which is closed in its front end by a sealing screw;

said common longitudinal conduit arranged such that when said valve body is in the rear most position said common longitudinal conduit is operatively connected with said inlet conduit; the rear end of said valve body being supported by a spring.

4,617,971

LOOM CONTROL SYSTEM

Jerker Hellstroem, Nol, Sweden, assignor to Aktiebolaget IRO, Ulricehamn and Aros Electronics AB, Askim, both of, Sweden

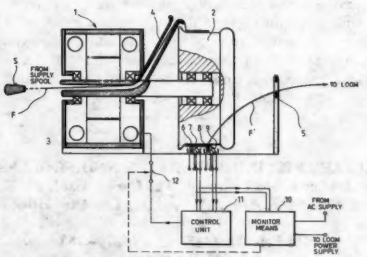
PCT No. PCT/EP83/00121, § 371 Date Jan. 10, 1984, § 102(e) Date Jan. 10, 1984, PCT Pub. No. WO83/04056, PCT Pub. Date Nov. 24, 1983

PCT Filed May 11, 1983, Ser. No. 588,866

Claims priority, application Sweden, May 12, 1982, 8202991

Int. Cl.⁴ D03D *51/34, 47/36;* B65H *51/20*

U.S. Cl. 139—370.2 **6 Claims**



1. A loom control system operable to stop a loom in the presence of a yarn breakage, said loom including a feeding device having a yarn storage drum for temporarily storing the

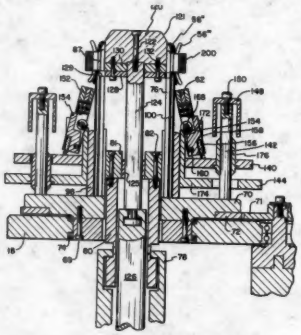
yarn, and yarn store sensor means for sensing the quantity of yarn stored on said drum of said feeding device and for transmitting an electric sensor signal representing the quantity of yarn stored on said drum to said feeding device to control the operation of said feeding device and to thereby control the quantity of yarn stored on said drum, said loom control system including monitor means for detecting a yarn breakage and for stopping the loom in the event of a yarn breakage, wherein the improvement comprises said monitor means being electrically connected to said yarn store sensor means for receiving said sensor signal therefrom, and said monitor means being responsive to said sensor signal representing the quantity of yarn stored on said drum for detecting a yarn breakage and said monitor means generating a stop signal for the loom in response to detection of a yarn breakage.

4,617,972

METHOD AND APPARATUS FOR WINDING AND INSERTING COILS IN A DYNAMOELECTRIC MACHINE STATOR CORE

Robert G. Walker, Ossian, Ind., assignor to Industra Products Co. Inc., Fort Wayne, Ind.

Filed Jun. 20, 1985, Ser. No. 747,125
Int. Cl.[4] H02K *15/06*
U.S. Cl. 140—92.1 **37 Claims**



1. Apparatus for winding and inserting coils in the slots of a stator core comprising:

coil winding tooling including a coil winding form, means for winding coils on said winding form, and a coil form stripper for stripping said coils from said form;

coil placer means including a plurality of blades, said placer means being relatively rotatable with respect to said winding tooling;

coil retainer means disposed radially outside said blades for receiving a coil from said coil winding form and for retaining said coil thereon during relative rotation of said placer means with respect to said winding tooling; and

stripper means operatively associated with said blades for stripping said coils from said blades and for inserting said coils into the slots of a stator core.

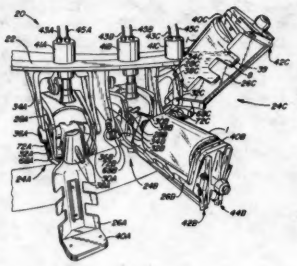
4,617,973

SELTZER FILLING APPARATUS AND PROCESS

Richard J. Hagan, 444 Laurel St., San Carlos, Calif. 94070, and Dennis A. Lempert, 11642 Dawson Dr., Los Altos Hills, Calif. 94022

Filed Feb. 20, 1985, Ser. No. 704,763
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—2 **24 Claims**

22. A process for filling a syphon package having a necked opening and a normally closed valve in the necked opening with a liquid, which comprises positioning said syphon package proximate to a head configured to engage the necked opening, the head including a means for applying a valve opening force to the valve in the necked opening, orienting the syphon package so that the necked opening faces downward, urging the syphon package into engagement with the head,



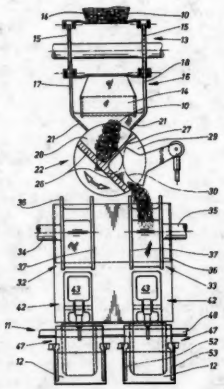
activating the valve opening force applying means to open the valve, supplying the liquid through the head, the valve and the syphon of the package to the syphon package, closing the valve, and allowing the filled syphon package to move out of engagement with the head.

4,617,974

APPARATUS FOR PACKAGING TOBACCO PORTIONS

Heinz Focke, and Oskar Balmer, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Feb. 11, 1985, Ser. No. 700,163
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 3409263
Int. Cl.[4] B65B *1/04*
U.S. Cl. 141—239 **6 Claims**



1. Apparatus for packaging measured portions of fibrous material into bags, comprising:

a packaging machine including a packaging turret having a plurality of pockets (46) each containing a bag to be filled with one of said measured portions; a conveyor for sequentially feeding said measured portions to said packaging machine;

star feeder means containing a plurality of pairs of cells, each cell sized to temporarily store a measured portion of said material;

means for causing at least two measured portions of said

material to be simultaneously transferred from two cells of one of said pairs of cells to two of said bags;

distributor means (22), arranged upstream of said star feeder means in the direction of material flow through said packaging apparatus, for sequentially transferring one measured portion and then another to said one of said pairs of cells, said distributor means comprising at least two portion chambers (28, 29), each of said portion chambers being positionable to receive a measured portion of said material from said conveyor; said portion chambers being arranged such that when one of said at least two portion chambers is positioned to receive a measured portion of said material from said conveyor, the other of said at least two portion chambers is positioned to discharge a measured portion stored therein to a cell of a cell pair and when the other of said at least two portion chambers is positioned to receive a measured portion from said conveyor, the one of said portion chambers is positioned to discharge a measured portion stored therein to the other cell of said cell pair; and

means for reciprocally moving said at least two portion chambers between a measured portion receiving position and a measured portion discharge position.

4,617,975

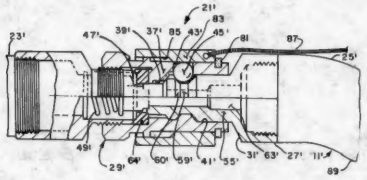
TENSION ACTUATED UNCOUPLER

Charles Rabushka, 436 Shadowridge Ct., St. Louis, Mo. 63011, and Layton J. Reprogle, 4430 Eminence, Berkeley, Mo. 63134

Continuation of Ser. No. 672,391, Nov. 16, 1984, abandoned, which is a division of Ser. No. 401,083, Jul. 23, 1982, abandoned. This application Sep. 20, 1985, Ser. No. 778,604

Int. Cl.[4] F16L *37/28*

U.S. Cl. 141—311 R **3 Claims**



2. In a fuel dispensing system including a fuel storage tank, a fuel dispensing station stationarily mounted on a foundation, a fuel supply line between said tank and said dispensing station, and a pump for delivering fuel via said fuel supply line from said tank to said dispensing station, the latter including a line therewithin connected to said fuel supply line and a flexible dispensing line having a free end and having a selectively operable nozzle on its free end for controlling the delivery of fuel into the fuel tank of a vehicle, wherein the improvement comprises: a tension actuated uncoupler installed in said flexible line for permitting the flow of fuel therethrough when coupled and for uncoupling at least a portion of said flexible line from another portion thereof in the event a tension load above a predetermined limit is applied to said flexible line thereby to minimize damage to said dispensing station, said uncoupler comprising a female fitting secured to one of said flexible line portions and a male fitting secured to the other portion of said flexible line, means carried by one of said fittings engageable with the other of said fittings when said male and female fittings are coupled together with the male fitting received within the female fitting for positively securing said fittings together in sealed, coupled relation and, upon the application of said tension load above said predetermined limit being applied to said flexible line, for shearing thereby to permit the uncoupling of said fittings from one another and to break said flexible line and to minimize damage to said dispensing station.

4,617,976

TIRE FOR USE IN RUNNING ON SOFT GROUND AND EXCELLENT IN GROUND-CONTACTING PROPERTY

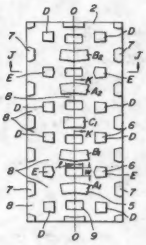
Junichi Kawajiri, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 19, 1984, Ser. No. 622,335

Claims priority, application Japan, Sep. 20, 1983, 58-172069

Int. Cl.[4] B60C *11/11*

U.S. Cl. 152—209 R **1 Claim**



1. A tire for use in running on the soft ground, comprising; a pair of sidewalls, a tread portion toroidally connected with both of the sidewalls and a carcass reinforcing the entire tire, said tread portion being provided with a plurality of rows of projecting blocks consisting of a hard tread rubber, which are isolated from one another by wide traverse grooves and longitudinal grooves, such that the total ground-contacting area of the blocks or lugs to the total area of the tread is in a range of 15 to 30%, said blocks composed of a central block row in the central portion of the tread, a pair of shoulder block rows in the shoulder portions of the tread and a pair of intermediate block rows between said central and said shoulder block rows each extending in the longitudinal direction of the tire, wherein the intermediate blocks are located so that the traverse grooves between central blocks serve as longitudinal grooves between said intermediate blocks, and the bottoms of traverse grooves in the central block row being provided recess-like dimples having a width (w) of 40 to 70% of the width of the longitudinally adjacent block a length (l) of said recess-like dimples being not shorter than one-half of the length of the traverse adjacent block for facilitating the flexural deformation of the tread and a maximum depth of said recess-like dimples is 7 to 15% of the height of the adjacent block, and wherein the rubber of the tread including the blocks is made of a rubber of Shore A hardness of 65°–85° and a 300% modulus of elasticity of 80 kg/cm^2–300 kg/cm^2.

4,617,977

CERAMIC CASTING MOULD AND A METHOD FOR ITS MANUFACTURE

David Mills, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed Jun. 30, 1983, Ser. No. 509,812

Claims priority, application United Kingdom, Jul. 3, 1982, 8219293

Int. Cl.[4] B22C *9/00, 9/04*

U.S. Cl. 164—30 **15 Claims**

1. A method of making a seamless ceramic casting mould with a thin outer wall comprising the steps of:

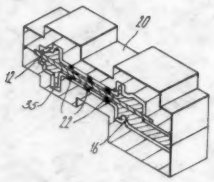
making a first die, at least a part of which defines the shape of an article to be cast,

providing within the die one or more high temperature disposable supports which support the thin outer mould wall during the firing process but which are disposable at a temperature at which the thin outer mould wall has acquired self-supporting strength,

filling the die with a disposable pattern material whereby the

supports become embedded in the pattern material, and allowing the pattern material to set,

removing the disposable pattern from the first die and inserting it into a second die, the inner surface of which is dimensioned to conform generally with the outer surface of at least the article-defining part of the pattern and to define a space therewith which conforms to the required thickness of the outer wall of the mould,



providing supports between the pattern and the die which are made from a ceramic material,

injecting a ceramic material under pressure into the space and allowing it to set to form the outer wall of the ceramic casting mould, the inner surface of such outer wall defining the outer surface of the article to be cast,

removing the disposable pattern from within the mould and firing the mould.

4,617,978

METHODS FOR THE COMPACTION OF FOUNDRY MOLDING MATERIAL

Norbert Damm, Karlsdorf-Neuthard, Fed. Rep of Germany, assignor to BMD Badische Maschinenfabrik Durlach GmbH, Karlsruhe, Fed. Rep. of Germany

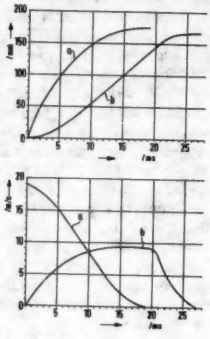
Filed Feb. 25, 1985, Ser. No. 704,774

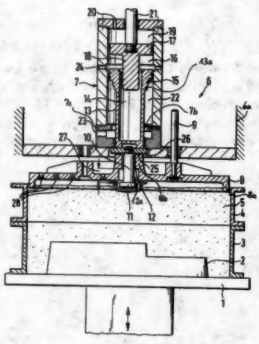
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1984, 3406466

Int. Cl.[4] B22D *15/00*

U.S. Cl. 164—37 **11 Claims**

1. A method of compacting foundry mold making material by the compression stroke of a pressing plate, said pressing plate being moved at a speed of up to 20 meters per second, said method comprising the steps of placing said pressing plate directly against a surface of such material, accelerating the pressing plate in an initial phase of said stroke, said initial phase lasting for up to 50% of the total compression stroke duration, such acceleration being progressive and bringing the pressing plate up to the maximum speed in said stroke, moving said pressing plate in a subsequent second phase of said stroke at a generally constant speed and then decelerating said pressing plate in a subsequent terminal phase of said stroke, said terminal phase lasting for 30% at the most of the total stroke duration.





4,617,979

METHOD FOR MANUFACTURE OF CAST ARTICLES OF FIBER-REINFORCED ALUMINUM COMPOSITE

Nobuyuki Suzuki, Shizuoka; Kenichi Tanaka, Tokyo, and Masanao Yamanashi, Shimizu, all of Japan, assignors to Nikkei Kako Kabushiki Kaisha and Nippon Light Metal Company Limited, both of Tokyo, Japan

Filed Jul. 15, 1985, Ser. No. 755,148

Claims priority, application Japan, Jul. 19, 1984, 59-148646; May 27, 1985, 60-112082

Int. Cl.[4] B22D *23/00, 19/14*

U.S. Cl. 164—97 **7 Claims**

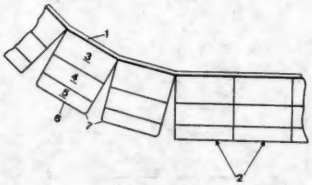
1. A method for the manufacture of cast articles of a fiber-reinforced aluminum composite, comprising the steps of mixing under pressure with an aluminum melt an inorganic fibrous reinforcement material prepared in advance in the form of a multiplicity of doughy pills thereby producing a composite melt and casting said composite melt in a desired shape either directly or after solidification and remelting.

4,617,980

CATERPILLAR TYPE MOLD HAVING MOLD LINKS WITH CHAMFERED EDGES

Urs Bänninger, Wollerau, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jun. 6, 1985, Ser. No. 741,691
Claims priority, application Switzerland, Jun. 15, 1984, 2906/84
Int. Cl.[4] B22D 11/06
U.S. Cl. 164—430 6 Claims



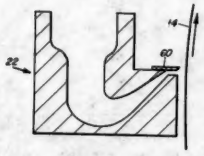
1. A caterpillar type mold for a casting machine for continuously casting metal strip which comprises a belt, a plurality of mold links attached to said belt, each of said mold links comprising a plate forming a work face of the mold, said plate having edges thereof adjacent said work face, wherein at least one of the said edges of the plate is a chamfered edge towards the mold work face that can expand when heated to provide a work face without projections between adjacent mold links which transfer to the cast strip and thereby produce a cast strip surface without flaws.

4,617,981

METHOD AND APPARATUS FOR STRIP CASTING

Robert E. Maringer, Worthington, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Filed May 9, 1980, Ser. No. 148,359
Int. Cl.[4] B22D 11/10, 11/18
U.S. Cl. 164—453 22 Claims



1. A method for continuously casting strip material onto a casting surface moving past a nozzle in a molten metal holding tundish comprising the steps of:

pouring molten metal into the tundish at a rate sufficient to establish a metallostatic head pressure of at least one-quarter pound per square inch at the nozzle within one second after pouring is initiated,

pouring additional molten metal into the tundish to effectuate an average rate of pressure change at the nozzle of at least one-quarter psi per second until the operating nozzle pressure of at least one-half pound per square inch is attained, and

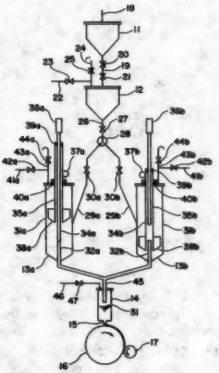
pouring additional molten metal into the tundish at a rate sufficient to maintain a substantially constant operating pressure at the nozzle through the casting operation.

4,617,982

METHOD OF AND APPARATUS FOR CONTINUOUSLY MANUFACTURING METAL PRODUCTS

Akira Tanimura, Kyoto; Hisayasu Tsubata, Uji, and Shoji Tamamura, Nara, all of Japan, assignors to Unitika Ltd., Osaka, Japan

Filed Jul. 11, 1984, Ser. No. 629,613
Claims priority, application Japan, Jul. 18, 1983, 58-131177
Int. Cl.[4] B22D 11/06, 11/10
U.S. Cl. 164—463 13 Claims



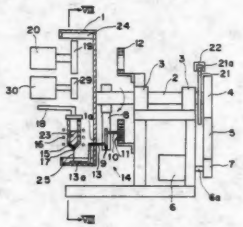
1. A process for manufacturing a metal product comprising the steps of supplying material for the product from pressure hopper means to each of a plurality of melting furnaces one after another in a predetermined amount each time, replacing the interior atmosphere of each melting furnace by an inert gas at a predetermined pressure, thereafter heating the material in the melting furnaces to form a molten metal, supplying the resulting molten metal from one of the melting furnaces after another to a discharge container having a discharge nozzle and made to have an inert gas atmosphere at substantially the same pressure as the pressure within the melting furnace from which the molten metal is being supplied, and continuously discharging the molten metal through the discharge nozzle against a rapid quenching device, the supplying of the molten metal to the discharge container from each melting furnace being conducted in a manner such that the surface of the molten metal within the discharge container is maintained at a substantially constant level except when the discharge of the molten metal against the rapid quenching device is initiated.

5. An apparatus for manufacturing a metal product comprising pressure hopper means for receiving material for the product successively in a predetermined amount each time, a plurality of melting furnaces each adapted to receive the predetermined amount of material from the pressure hopper means in turn for heating the material to form a molten metal, a discharge container for receiving the resulting molten metal from one of the melting furnaces after another and continuously discharging the molten metal through a discharge nozzle, a rapid quenching device for solidifying the discharged molten metal from the nozzle by rapid quenching, means for supplying the molten metal within each melting furnace to the discharge container in a manner such that the surface of the molten metal within the discharge container is maintained at a substantially constant level except when the discharge of the molten metal against the rapid quenching device is initiated, and means for supplying an inert gas to at least the melting furnaces and the discharge container in a manner such that the pressure within the discharge container is substantially the same as the pressure within the melting furnace from which the molten metal is being supplied.

4,617,983
METHOD AND APPARATUS FOR CONTINUOUSLY MANUFACTURING METAL FILAMENTS

Hisayasu Tsubata, Uji; Shoji Tamamura, Nara, and Akira Tanimura, Kyoto, all of Japan, assignors to Unitika Ltd., Japan

Filed May 16, 1985, Ser. No. 734,789
Claims priority, application Japan, May 21, 1984, 59-103315
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—463 **12 Claims**



1. A method of continuously manufacturing a metal filament wherein a cooling liquid layer is formed by centrifugal force on the inner periphery of a rotary drum in rotation, and wherein molten metal is streamed as a jet toward the cooling liquid layer so that it is quenched to solidify into a metal filament, the metal filament thus obtained being wound on a winder provided outside the rotary drum, characterized in that the method comprises, prior to the metal filament being wound on the winder,

(a) positioning the front end portion of the metal filament on a pickup which rotates synchronously with the rotary drum and which, while in said synchronous rotation, is radially displaceable by cam means between a first radial position in the cooling liquid layer and a second radial position nearer to the rotation axis of the rotating drum than the first radial position,

(b) attracting the front end portion of the metal filament by attracting and holding means when the pickup reaches the second radial position, and

(c) causing the attracting and holding means to draw in and hold a following portion of the metal filament subsequently paid out from the rotary drum.

4,617,984
METHOD OF INDIRECT LIQUID-PHASE HEAT TRANSFER

Ronald H. Harding, Westport, Conn., and George E. Totten, West Haverstraw, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 28, 1985, Ser. No. 749,772
Int. Cl.[4] F28F *23/00*; C09K *5/00*
U.S. Cl. 165—1 **13 Claims**

8. A method of liquid phase heat transfer which comprises continuously circulating between a heat generating and a heat using source a composition comprising (a) a substantially anhydrous polymer of the formula:

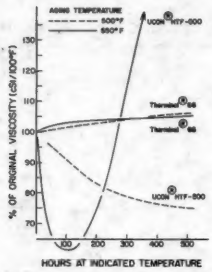
$$RO\text{-}(CH_2)_xO\text{-}_yR'$$

wherein

R and R′ are independently hydrogen or a C_1 to C_4 aliphatic alkyl;

x is an integer having a value of 3 or 4; and

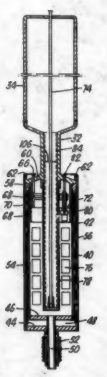
y is a sufficiently large integer to provide the polymer with a molecular weight of from about 300 to about 1,000, and (b) a sufficient amount of at least one stabilizer to provide (i) a viscosity loss or (ii) a viscosity gain of less than about 30%, after approximately 500 hours of continuous use at a temperature of about 550° F. as per the Thermal Stability Test.



4,617,985
HEAT PIPE STABILIZED SPECIMEN CONTAINER

Geoffrey W. Triggs; Richard J. Lightowlers, both of Warrington; Derek Robinson, Preston, and Graham Rice, Wokingham, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 27, 1985, Ser. No. 769,745
Claims priority, application United Kingdom, Sep. 11, 1984, 8422852
Int. Cl.[4] G05D *23/00*; F28D *15/00*
U.S. Cl. 165—32 **9 Claims**



1. A specimen container for immersion in the liquid metal coolant of a liquid metal cooled nuclear reactor, said container incorporating a centrally located heat pipe around which there is an annular space for reception of specimens, the container further being provided with inlet means for admitting the liquid metal coolant into the lower end thereof and restricted outlet means through which liquid metal coolant can flow out of the container while leaving a space at the upper end of the container, which space is filled with low thermal conductivity gas, the container being of double walled construction along its length and at its lower end with low thermal conductivity gas filling the interspaces between the walls, the heat pipe enclosing a gas which is not condensable in use of the container as well as a vaporizable substance such as sodium, the heat pipe including an evaporation section which is in heat exchange with the specimen receiving space of the container, a condenser section which is in heat exchange with liquid metal coolant flowing externally of the container and is separated from the evaporation section by an adiabatic section, and a gas

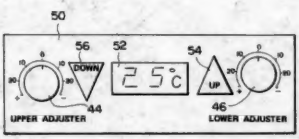
buffer section, and the arrangement being such that the rate of evaporation of said substance determines the volume occupied by the gas which, in turn, governs the volume available within the condensation section.

4,617,986

AIR CONDITIONING ARRANGEMENT FOR AUTOMOTIVE VEHICLE OR THE LIKE

Shinma Kobayashi, and Shunsuke Kajita, both of Hiratsuka, Japan, assignors to Nissan Shatai Company, Limited, Hiratsuka, Japan

Filed Aug. 30, 1983, Ser. No. 527,784
Claims priority, application Japan, Aug. 31, 1982, 57-150143
Int. Cl.⁴ B60H *3/00*
U.S. Cl. 165—42 **18 Claims**



1. An air conditioning unit for conditioning air in an enclosed space having an upper region and a lower region, comprising:

a duct arrangement for separately discharging air into said upper region and said lower region;

a heat exchanging arrangement associated with said duct for varying the temperature of the air in said duct;

a temperature setting means for setting a desired temperature in said enclosed space;

a sensor arrangement including a device for sensing the temperature of the air in said upper region and the temperature of the air in the lower region and for outputting an indication thereof;

a temperature control device associated with said duct arrangement for selectively varying the temperature of the air discharged into said upper region and for selectively varying the temperature of air discharged into said lower region; and

a required deviation setting means for manually setting a first required deviation which is representative of a desired deviation from a first target temperature derived from said desired temperature and about which the temperature of air to be discharged into one of said upper and lower regions is adjusted; and

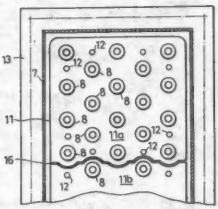
a control circuit responsive to an input indicative of said desired temperature from said temperature setting means, and to an input indicative of said first required deviation from said required deviation setting means and to the output of said sensor arrangement for controlling said temperature control device for adjusting the temperature of air to be discharged towards the upper and lower regions separately from each other, said control circuit deriving said first target temperature and said second target temperature about which the temperature of air to be discharged into said lower region is adjusted, said first and second target temperatures being derived with respect to said desired temperature, and said first target temperature and second target temperature being mutually independently variable.

4,617,587

APPARATUS FOR CLEANING HEAT EXCHANGER TUBES

Masakazu Fujimoto, and Naoyuki Inoue, both of Tokyo, Japan, assignors to Ebara Corporation, Japan

Division of Ser. No. 678,780, Dec. 6, 1984, Pat. No. 4,583,586.
This application Jan. 6, 1986, Ser. No. 816,627
Int. Cl.⁴ F28G *1/12, 15/02*
U.S. Cl. 165—95 **4 Claims**



1. Apparatus for cleaning inner surfaces of heat exchanger tubes of a heat exchanger, wherein said heat exchanger includes a bundle of elongate heat exchanger tubes having opposite ends mounted to respective partition plates and communicating with respective forward and rearward heat exchanger fluid enclosures, each end of each of said heat exchanger tubes being provided with a chamber for capturing a tube cleaning element adapted to move in opposite directions through said tube upon reversing the direction of flow of heat exchanger fluid therethrough so that said inner surface of said tube is cleaned by the moving tube cleaning element, the improvement comprising:

said chambers being detachably mounted to respective ends of said tubes by mounting means including holder plate means having openings formed therethrough at locations corresponding to the locations of said tube ends mounted to a respective partition plate, and means for mounting said holder plate means to said partition plate,

each chamber including an integral flange portion formed at one end thereof, said flange portion being held between said partition plate and said holder plate means, and

said holder plate means being separated into at least two holder plate members.

4,617,988

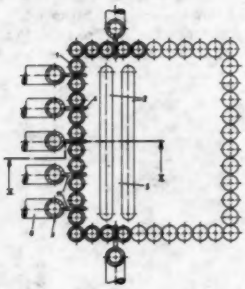
SOOT BLOWER FOR THE REMOVAL OF DEPOSITS FROM SURFACES OF HEAT EXCHANGERS OR THE LIKE

Klaus Köhnen, Mülheim; Hans Niermann, and Norbert Ullrich, both of Essen, all of Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 594,772
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1983, 3312599
Int. Cl.⁴ F28G *1/16*
U.S. Cl. 165—95 **16 Claims**

1. A soot blower for the removal of deposits from walls of tubes positioned in an interior of a heat-exchanger, reaction vessel or the like, comprising means for feeding a blowing medium into said interior, said blower being integrated with

said heat exchanger, said feeding means including a plurality of feeding pipes each having a nozzle tube directed into said



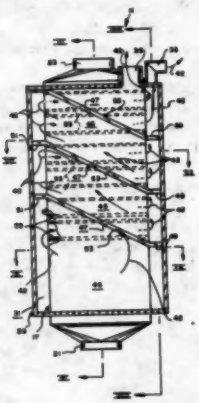
interior and terminated with a nozzle open into the interior so as to direct and blow said blowing medium over said walls.

4,617,989

EXHAUST FLUE HEAT EXCHANGE DEVICE

Bobby G. Seat, 3794 Miami, Memphis, Tenn. 38111

Filed Mar. 22, 1985, Ser. No. 714,945
Int. Cl.[4] F28F 9/22
U.S. Cl. 165—145 **9 Claims**



1. A heat exchange device interposed in an exhaust flue for extracting heat from a first medium passing through said flue and transferring that heat to a second medium, said device comprising:

(a) a first chamber having an inlet and an outlet coupled to said flue for allowing said first medium to pass therethrough;

(b) a second chamber having an inlet and an outlet for allowing said second medium to pass therethrough, said second chamber having a common boundary with at least a portion of said first chamber; and

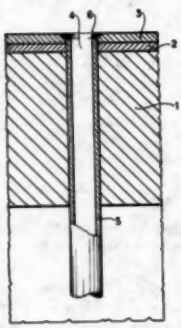
(c) guide means for causing said second medium to move between said inlet and outlet of said second chamber and over said common boundary between said first and second chambers, said guide means including baffle means for dividing the interior of said second chamber into at least a first subchamber and a second subchamber and including pipe means having at least one pipe member extending from said first subchamber of said second chamber through the interior of said first chamber and to said second subchamber of said second chamber for allowing said second medium to pass therethrough, said pipe means providing the only pathway for allowing the passage of said second medium between said subchambers said baffle means including at least one incline portion for causing said second medium to move along an incline relative to the longitudinal axis of said first chamber.

4,617,990

ASSEMBLY OF FERRITIC STAINLESS STEEL TUBES ON A CARBON STEEL TUBE-PLATE

Marc Franzolini, Chevry II; Edmond Maria, Asnieres; Alain Vanderschaeghe, Roubaix, and Jean Bezier, Croix, all of France, assignors to Stein Industrie, Velizy Villacoublay, France

Filed Jul. 5, 1984, Ser. No. 628,081
Claims priority, application France, Jul. 6, 1983, 83 11262
Int. Cl.[4] F28F 9/18
U.S. Cl. 165—173 **2 Claims**



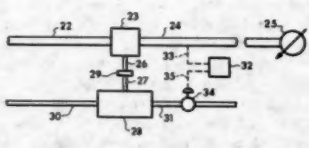
1. In a welded assembly of tubes of low carbon ferritic stainless steel having 17 to 18.5% by weight chromium projecting through holes within a tube-plate of carbon steel, the improvement wherein said tube-plate includes at least one overlay of low carbon non-alloyed steel on the surface of the tube-plate opposite the plurality of tubes, of given thickness, and the ends of the tubes being located at an intermediate level of the overlay and weld beads between the ends of the tubes and the overlay.

4,617,991

POLYMER FLOW CONTROL APPARATUS

Wayne E. Luetzelschwab, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Continuation of Ser. No. 515,416, Jul. 20, 1983, Pat. No. 4,535,844. This application Jun. 18, 1985, Ser. No. 746,219
The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.
Int. Cl.[4] E21B 43/22, 47/00
U.S. Cl. 166—53 **6 Claims**



1. A system located at ground level for preparing an aqueous solution of a partially hydrolyzed polyacrylamide and injecting the solution into an input well of an oil-bearing subterra-

nean formation, said system including polymerization apparatus, hydrolyzation apparatus and dilution apparatus, said system further including flow control apparatus located downstream from the dilution apparatus of the system and upstream with relation to the input well of the oil-bearing subterranean formation for controlling the flow of the aqueous solution of the partially hydrolyzed polyacrylamide through a conduit while preventing or substantially minimizing degradation of the partially hydrolyzed polyacrylamide in solution, said flow control apparatus comprising:

a hydraulic motor having an inlet in fluid communication with the dilution apparatus of the system, an outlet in fluid communication with the input well of the oil-bearing subterranean formation and a drive means adapted to be contacted by the aqueous solution of the partially hydrolyzed polyacrylamide as it enters the inlet of the hydraulic motor, said drive means acting to bring about a pressure drop in the solution as it passes across the hydraulic motor;

output means engaged to the drive means of the hydraulic motor and movable in response to the movement of the drive means caused by said solution; and

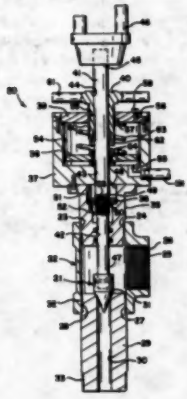
a variable load means driven by said output means and in communication with a regulator means for selectively regulating the rate at which the drive means of the hydraulic pump is caused to move by said solution, the selected flow rate being such that no, or minimal degradation, of the polyacrylamide will occur as said solution undergoes a drop in pressure as it passes across the hydraulic motor.

4,617,992

SYSTEM AND CHOKE VALVE ACTUATOR MECHANISM FOR OPERATING A PLUNGER LIFT WELL

Thomas E. Abel, 1183 MacIntosh Dr., Dellroy, Ohio 44620

Filed May 3, 1985, Ser. No. 730,049
Int. Cl.[4] E21B *34/02*; F16K *31/122*
U.S. Cl. 166—95 **4 Claims**



1. An actuator mechanism for selective positioning of a choke valve element relative to a valve seat within a piping flow tee for regulating the flow of gas and oil from a producing wellhead, said flow tee having an opening to receive and connect said actuator mechanism, an inlet opening for conducting gas and oil toward said choke valve seat and an outlet opening for conducting gas and oil beyond said choke valve seat:

said actuator mechanism comprising a closed body member with a base end adapted for connection with said flow tee opening, a control shaft positioning collar housed within said body member, a cylinder member connected to the upper end of said body member, a control piston housed within said cylinder member, a cap member connected to the upper end of said cylinder member, a control piston stop sleeve carried by said cap member and an elongated control shaft;

said control shaft extending coaxially through said body member, said control shaft positioning collar, said cylinder member, said control piston, said cylinder cap member and said stop sleeve;

said body member, said cylinder member and said stop sleeve each having a small diameter axial bore for rotatable and slidable mounting of said control shaft;

said control shaft having an upper end projecting above said stop sleeve and adapted for carrying a handwheel thereon and a lower end projecting below said body member and into said flow tee and adapted for carrying said choke valve element thereon;

said body member upper end having a larger diameter chamber bore extending radially above said axial bore therein for nonrotatable mounting and seating of said control shaft positioning collar;

said cylinder member having a larger diameter piston bore extending radially above said axial bore therein for movable mounting of said control piston and a control fluid supply conduit extending from the external surface of said cylinder member and into the lower face of said piston bore;

said cylinder cap member having an axial bore therein adapted for rotatable and manually adjustable mounting of said stop sleeve coaxially around the section of said control shaft within said cylinder member;

said control shaft being connected to said control piston within said cylinder piston bore and raisable toward said cylinder cap member in response to the pressure of a control fluid introduced into said piston bore through said cylinder fluid supply conduit, and against a compression means seated around said stop sleeve between said cap member and said control piston;

said control shaft having a section within said body member adapted for rotatable engagement with said control shaft positioning collar.

4,617,993

CARBON DIOXIDE STIMULATED OIL RECOVERY PROCESS

Alfred Brown, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 3, 1985, Ser. No. 772,108
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—250 **11 Claims**

1. A method for recovering petroleum from a subterranean petroleum-containing formation penetrated by at least one well in fluid communication with the formation, by a cyclic carbon dioxide injection procedure comprising injecting carbon dioxide into the well followed by a soak period, followed by a production phase wherein oil is recovered from the formation via the well, wherein the improvement comprises

introducing a predetermined quantity of hydrocarbon which is liquid at the temperature of the formation into the formation immediately after introducing the carbon dioxide slug and before the soak and production steps, to dissolve high molecular weight fraction of the crude oil left in the flow channels of the formation, and recovering the solvent and high molecular weight fractions from the formation in the production phase via the well.

4,617,994

DETERMINING RESIDUAL OIL SATURATION BY INJECTING CO_2 AND BASE GENERATING REACTANT

Edwin A. Richardson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 22, 1985, Ser. No. 800,852
Int. Cl.[4] E21B *47/00*
U.S. Cl. 166—250 5 Claims

1. A process for determining the relative concentrations of substantially immobile oil phase fluid and relatively mobile water phase fluid within a subterranean reservoir formation comprising:

injecting fluid consisting essentially of an aqueous solution which at least soon after entering the reservoir formation contains at least a detectible concentration of dissolved CO_2 and a concentration of subsequently active pH increasing reactant material which at the temperature of the reservoir formation is sufficient to convert a significant proportion of the dissolved CO_2 to dissolved bicarbonate ion;

then injecting an aqueous solution which contains at least said concentration of dissolved CO_2 but is free of said reactant;

allowing the occurrence of said pH increasing reaction;

producing the injected fluid and measuring the variation with amount of fluid produced in the concentration of both dissolved CO_2 and dissolved bicarbonate ion; and

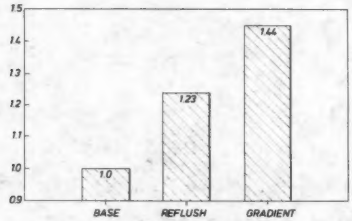
determining relative concentrations of said oil phase and water phase fluids indicated by the extent of chromatographic separation between the reduction in concentration of dissolved CO_2 and the increase in concentration of dissolved bicarbonate ion.

4,617,995

DUAL GRADIENT STEAM FOAM OIL DISPLACEMENT PROCESS

Hon Chung Lau, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 22, 1985, Ser. No. 768,010
Int. Cl.[4] E21B *43/24, 43/22*
U.S. Cl. 166—272 8 Claims



1. In an oil displacement process in which oil is displaced by injecting pretreatment fluid, steam and steam-foaming surfactant into a reservoir in which surfactant transport is impeded by an ion-exchange of multivalent cations from the rocks, an improvement comprising:

injecting said pretreatment fluid in a volume totalling not more than about the volume of the pore space to be traversed in flowing from the injection location to the location within the reservoir into which the oil is to be displaced;

arranging the composition of said pretreatment fluid in correlations with the properties of the reservoir rocks so that the injected volume of the pretreatment fluid contains both (a) sufficient monovalent cations to ion-exchange with at least most of the multivalent cations on the reservoir rocks contacted by that fluid, and (b) enough steam-foaming surfactant to substantially satisfy the surfactant transport-impeding effects of the rocks contacted by the pretreatment fluid; and

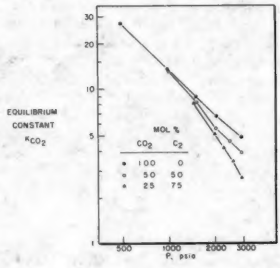
injecting steam-foaming fluid, comprising steam, steam-foaming surfactant, and monovalent electrolyte, in which the proportions of the surfactant and electrolyte are each less than about half of those contained in the pretreatment fluid.

4,617,996

IMMISCIBLE OIL RECOVERY PROCESS

Winston R. Shu, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 704,232, Feb. 22, 1985. This application Apr. 22, 1985, Ser. No. 726,195
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—273 33 Claims



1. A method for the recovery of oil from a subterranean, oil-bearing reservoir penetrated by an injection well and a production well extending from the surface of the earth into the reservoir, which method comprises:

(i) injecting into the reservoir through the injection well, a mixture of an oil-displacing fluid, which is essentially immiscible with the oil under the conditions prevailing in the reservoir, and up to 25 mole percent of a hydrocarbon additive thereby forming a mobile phase which substantially increases the limited solubility of the displacing fluid in the reservoir oil to reduce the viscosity of the reservoir oil; and

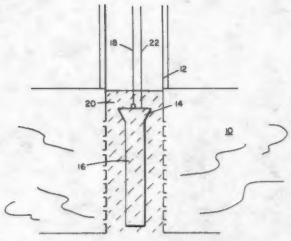
(ii) producing fluids including oil from the production well.

4,617,997

FOAM ENHANCEMENT OF CONTROLLED PULSE FRACTURING

Alfred R. Jennings, Jr., Plano, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 26, 1985, Ser. No. 769,226
Int. Cl.[4] E21B *43/263*
U.S. Cl. 166—299 24 Claims



1. A method for fracturing a subterranean formation pene-

trated by at least one well which extends from the surface of the earth to the formation comprising:

(a) filling said well above the productive interval with a fluid containing a foaming agent sufficient to cause foam to be generated for entry into induced fractures;

(b) placing into said well within said fluid and near the productive interval a propellant means for fracturing said formation by a pressure loading rate sufficient to create multiple fractures and which upon ignition creates gases, heat, and a pressure loading rate sufficient to create multiple fractures and cause said foaming agent to foam;

(c) igniting said proepllant whereby said foaming agent foams and the foam enters into the multiple fractures created by said pressure loading rate; and

(d) maintaining the peak pressure load sufficiently above the in-situ stress pressure but below the rock yield stress for a time sufficient to allow foam generation, fluid penetration and extension of said fractures.

4,617,998

DRILLING RISER BRAKING APPARATUS AND METHOD

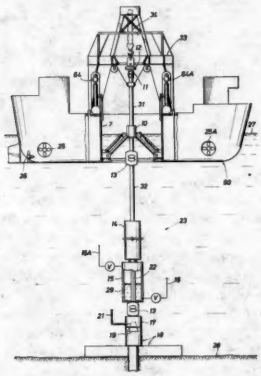
Carl G. Langner, Spring, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 8, 1985, Ser. No. 720,842

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

Int. Cl.[4] E21B *19/09*

U.S. Cl. 166—345 **37 Claims**



1. For use in a floating vessel having a substantially centrally-positioned vertical hull opening therethrough, said vessel being provided with well drilling equipment, including an elongated vertical riser provided with a riser brake contact area carried outwardly near the upper end thereof, said riser extending in tension down through said hull opening to a point adjacent the ocean floor, and motion-compensating and tensioning means carried by said vessel operatively connected to said riser for vertically supporting said riser during normal operations, the invention comprising riser braking means apparatus carried by said vessel substantially within the hull opening through the vessel, said braking means apparatus comprising:

brake element means carried by said vessel operatively engaged between said vessel and said riser brake contact area to arrest and prevent further movement of said riser upper end relative to said vessel; and

brake element means prime mover means operatively connected between said vessel and said brake element means, for moving said brake element means.

28. A method of arresting and preventing further movement of the elements forming the upper end of a riser relative to a floating vessel therethrough, said vessel being provided with well drilling equipment including a derrick with associated drill string lift equipment, an elongated vertical riser provided with a riser brake contact area carried outwardly near said riser upper end thereof, a wellhead connector carried at the lower end of said riser and secured to a wellhead assembly, and adjustable buoyancy means formed with the submerged portion of said riser, said riser extending in tension during normal operations down through said hull opening to a point adjacent said wellhead assembly located adjacent the ocean floor, said vessel carrying motion-compensating and tensioning means operatively connected to said riser upper elements for vertically supporting said riser during normal operations, and provided with riser braking means apparatus, said apparatus including at least one pair of brake elements carried by braking beams operatively connected to said vessel, said method comprising:

moving said brake elements toward said riser brake contact area;

engaging said brake elements with said riser brake contact area in order to dampen, arrest, and prevent further movement of said riser upper elements relative to said floating vessel; and

remotely disconnecting the wellhead connector at the lower end of said riser from said wellhead assembly.

4,617,999

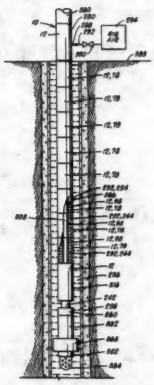
DOWNHOLE TOOL WITH COMPRESSION CHAMBER

Harold K. Beck, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 28, 1984, Ser. No. 676,138

Int. Cl.[4] E21B *34/06*

U.S. Cl. 166—372 **32 Claims**



1. A downhole tool apparatus, comprising:

a housing, having a compression chamber defined therein, and having a fill passage means disposed through said housing for placing said compression chamber in open flow fluid communication with a well annulus exterior of said housing so that well fluid may flow into said compression chamber as said apparatus is lowered into a well;

an isolation valve means for selectively closing said fill passage means and for thereby trapping said well fluid in said compression chamber;

an operating element disposed in said housing;

an acutating piston means slidably disposed in said housing and operably associated with said operating element, said actuating piston means having a first side in fluid pressure communication with said compression chamber so that movement of said actuating piston means between first

and second positions thereof relative to said housing decreases a volume of said compression chamber; and

an injection means for injecting pressurized gas into said compression chamber at a location within said compression chamber such that said injected gas will directly contact at a gas-well fluid interface an upper surface of well fluid that flows into said compression chamber

whereby a majority of a volume of said compression chamber is defined by a plurality of interconnected tubular outer housing sections and by a plurality of interconnected tubular inner housing sections, said majority of said volume of said compression chamber being a diametrically irregular annular space between said plurality of interconnected tubular outer housing sections and said plurality of interconnected tubular inner housing sections.

16. A method of operating a downhole tool, said method comprising the steps of:

(a) providing in said tool an operating element, an actuating piston operatively associated with said operating element, and a compression chamber defined within said tool and communicated with a first side of said actuating piston, wherein a majority of a total volume of said compression chamber is a diametrically irregular elongated annular space defined between a plurality of interconnected tubular outer housing sections and a plurality of interconnected tubular inner housing sections of said tool;

(b) lowering said tool, connected to a tubing string, to a desired location in a well;

(c) during said step (b), providing open flow fluid communication through a fill passage between said compression chamber and a well annulus defined between said tubing string and a well bore of said well;

(d) during said step (b), flowing well fluid through said fill passage into said compression chamber so that said well fluid directly contacts as a gas-well fluid interface, a volume of gas contained in said compression chamber; and

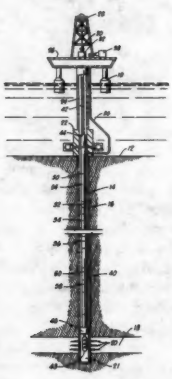
(e) during said step (d) moving said gas-well fluid interface upward past a plurality of diametrically irregular surfaces defining said diametrically irregular elongated annular space or said compression chamber.

4,618,000

PUMP OPEN SAFETY VALVE AND METHOD OF USE

Wesley J. Burris, II, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 8, 1985, Ser. No. 699,962
Int. Cl.[4] E21B *34/06*
U.S. Cl. 166—373 **20 Claims**



1. A downhole tool apparatus, comprising:

a housing having an upper end adapted to be connected to a tubing string, and having a housing bore adapted to be communicated with a tubing bore of said tubing string;

an operating element disposed in said housing; and

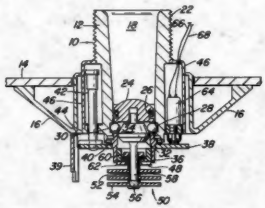
actuating means including a first pressure responsive actuating mandrel for inducing movement of said operating element from a first position to a second position in response to a pressure change in one of said tubing bore or a well annulus outside said housing with respect to a first reference pressure, and a second pressure responsive actuating mandrel for inducing movement of said operating element from a second position to a third position in response to a pressure change in the other of said tubing bore or said well annulus with respect to a second reference pressure, at least one of said first and second reference pressures being provided in a sealed zone within said downhole tool apparatus.

4,618,001

SPRINKLER HEAD WITH ELECTRICAL SENSOR

Brian T. Hoening, Sellersville, Pa., assignor to Central Sprinkler Corporation, Lansdale, Pa.

Filed Mar. 18, 1985, Ser. No. 713,529
Int. Cl.[4] A62C *37/18, 37/24*
U.S. Cl. 169—23 **4 Claims**



1. A sprinkler head comprising a housing having a flow passage therethrough between an inlet and an outlet, a valve member closing said outlet, said valve member being supported by said housing and being movable to an open position, means for retaining the valve member in a closed position, a temperature responsive means for releasing said retaining means at a predetermined temperature so that the valve member may move to an open position, switch means on said housing for providing an electrical signal when said valve member has moved from its closed position towards its open position, an alarm responsive to said signal, and housing means for protecting said switch means from contact with a fire quenching liquid discharged from said outlet, said switch means including an actuator connected to a contact member of dielectric material, said housing means including a protective sleeve for said actuator, said sleeve surrounding said actuator and being connected to one end of said contact member, said contact member being in contact with an element attached to the valve member when the valve member is in its closed position, said element cooperating with said actuator to maintain the switch means in an open position so long as the valve member is in its closed position.

4,618,002

FIRE PROTECTION SPRINKLER HEAD

James W. Mears, Warwick, R.I., assignor to Grinnel Corporation, Providence, R.I.

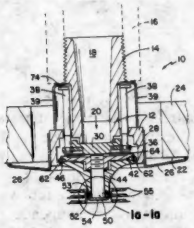
Continuation of Ser. No. 589,224, Mar. 13, 1984, abandoned.
This application Jan. 16, 1986, Ser. No. 820,877
Int. Cl.[4] A62C *37/10*
U.S. Cl. 169—37 **11 Claims**

1. In a fire protection sprinkler head of the automatic type comprising a body with means for connecting said head to a supply of fire retardant fluid, a passage through siad body for

said fluid, a closure means for sealing said passage, a latch means for retaining said closure means in a standby position wherein said passage is sealed by said closure means, and a thermally responsive means adapted to release said latch means from said standby position at a preset temperature to thereby release said closure means to allow flow of fluid from said passage,

the improvement wherein

said latch means comprises a catch in the form of a lip disposed generally radially inwardly from said body and having a surface sloped inwardly from said body toward said lip, a radially inwardly biased spring detent means, and first and second relatively separable, detent restraining elements, arranged on a common axis,



said restraining elements cooperatively defining a circumferential generally V-shaped groove sized and adapted to receive said spring detent means and being further adapted to mutually act to force said spring detent means radially outward into engagement with the inwardly sloped surface of said catch to secure and maintain said latch means in said standby position, and

said first restraining element being adapted to move along said axis relative to said second restraining element to deepen said groove when the thermally responsive means reaches said preset temperature to thereby permit and accommodate said spring detent means to relax radially inwardly along said inwardly sloped surface, toward said lip, and to disengage from said catch whereby said latch means is released from said standby position.

4,618,003

WEEDER-CULTIVATOR

John L. Hostetter, Rte. 3, Box 385A, Mountain Home, Ark. 72653

Filed Mar. 5, 1985, Ser. No. 708,551
Int. Cl.[4] A01B *1/16*
U.S. Cl. 172—25 **6 Claims**

1. A combined weeding and cultivator tool assembly including an elongated shank having a ground piercing lower end and an upper end including structure for applying rotary torque to said shank, the lower end of said shank supporting only a single elongated rigid strap-type blade therefrom including a generally horizontal elongated upper end portion having a first end thereof mounted on said shank above the lower terminal end thereof for rotation with said shank and with the other end of said upper end portion projecting outwardly from one side of said shank, curving downwardly and inwardly toward said shank and terminating downwardly in a generally straight and downwardly inwardly inclined lower end portion of said blade, the downwardly curving other end of said upper end portion being slightly twisted about its longitudinal axis to angularly offset said inclined lower end portion and position the lower terminal end of said lower end portion slightly outward of a second side of the lower end of said shank angularly displaced less than 90° from said first side, said lower terminal end of said blade including a sharpened endwise outwardly

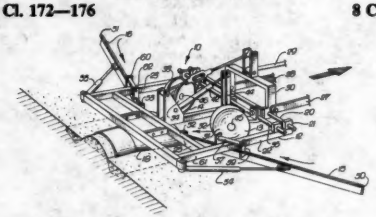
facing transverse ground cutting edge facing in a direction generally paralleling a path tangent to said second side.

4,618,004

METHOD AND APPARATUS FOR BUILDING BORDERS

Cecil J. Howard, P.O. Box 294, Wasco, Calif. 93280

Filed Sep. 24, 1984, Ser. No. 653,095
Int. Cl.[4] A01B *13/02*
U.S. Cl. 172—176 **8 Claims**



1. A device for building earthen ridges or borders on an agricultural field comprising:

a. a mobile supporting frame assembly;

b. a pair of opposing spaced apart disc plow assemblies supported from the frame assembly and adapted to cultivate parallel trenches in the agricultural field, to remove cultivated dirt from the parallel trenches and to deposit the removed dirt onto the ground between the trenches;

c. means to scrape dirt into the trenches from the agricultural field, blade means extending outwardly from the trenches to scrape dirt into the trenches from the agricultural field adjacent thereto, the lower edges of said blade means being at a higher level than the lower edges of the disc plow assemblies; and

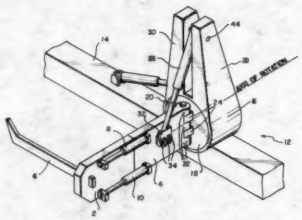
d. means to compress and shape the dirt deposited on the ground between the trenches to form the earthen borders or ridges.

4,618,005

ORIENTABLE RIPPER

Douglass G. Tower, 724 Somerset Ave., Princess Anne, Md. 21853

Filed Aug. 20, 1984, Ser. No. 641,997
Int. Cl.[4] E02F *3/76, 5/30;* **A01B** *63/106, 63/118*
U.S. Cl. 172—459 **1 Claim**



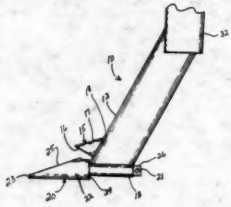
1. Apparatus comprising rotational tool mounting means for being attached to a vehicle, said rotational mounting means comprising a bearing housing, a rotatable journal received by said bearing housing for rotation about a first axis, and said bearing housing upstanding pillar means extending in a direction transverse to said first axis for supporting a first power means, second power means for rotating said journal, second arm means pivotally connected to said journal for rotation with respect to said journal about a second axis transverse to said first axis, first arm means pivotally connected to said second arm means for rotation about a third axis parallel to said second axis, ripper means secured to and extending transversely to said first arm means, third power means connected between said first and second arm means for controlling the angular relationship about said third axis, said first power means extending between said pillar means and a pivotal connector means on said first arm means, said pivotal connector means attaching said first power means to said second arm means and allowing relative pivotal movement between said first power means and said second arm means.

4,618,006

RIPPER IMPLEMENT

Keith J. Cosson, Grand Island, Nebr., assignor to C. C. Sales Corporation, Grand Island, Nebr.

Filed Jun. 1, 1984, Ser. No. 616,139
Int. Cl.[4] A01B *13/08*
U.S. Cl. 172—699 **13 Claims**



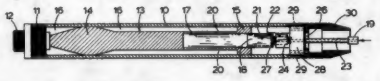
1. In an agricultural ripper tiller implement having a downwardly and forwardly depending shank and a shoe member slightly wider than said shank carried by the lower end of said shank, wherein the improvement comprises said shank having a leading edge, wherein a forwardly projecting soil fracturing member is secured to said leading edge of said shank spaced above said shoe member, wherein the lower edge of said soil fracturing member projects outwardly from said shank over the rearward end of said shoe member to present a downwardly facing surface capable of fracturing soil leaving said rearward end of said shoe member, and wherein said soil fracturing member is adapted to fracture soil ahead of said leading edge of said shank.

4,618,007

IMPACT-ACTION SELF-PROPELLED MECHANISM FOR DRIVING HOLES IN THE EARTH

Allan G. Kayes, Sittingbourne, England, assignor to Pneumatic Punchers Limited, Sittingbourne, England

Filed Apr. 2, 1985, Ser. No. 718,868
Int. Cl.[4] E21B *7/26*
U.S. Cl. 175—19 **3 Claims**



1. A pneumatically operated impact-action self-propelled mechanism for driving holes in the earth comprising a cylindrical housing having a forward and a rear end and an anvil member located at the forward end; an impact piston reciprocal in the housing to deliver successive impacts to the anvil member and forming within the housing a forward chamber of variable volume; said impact piston having a rear space defined by a rearwardly extending side wall; a control assembly comprising a forwardly extending sleeve which is slidably received within the rear space of said impact piston to form a rear chamber of variable volume; a tube having connecting means for connection to a compressed air supply and a central passage connected to said sleeve for continuous supply of compressed air into said rear chamber and therefrom into said forward chamber through apertures in the side wall of the rear chamber of said impact piston; and means for lockably locating said sleeve longitudinally with respect to said apertures for providing forward or reverse movement of said mechanism, said control assembly further comprising a rearwardly extending cylindrical member connected to said sleeve and tube, said cylndrical member carrying a pin extending diametrically therefrom to engage in a generally Z-shaped slot formed in a further cylinder which partially surrounds said rearwardly extending cylindrical member and is located in a fixed position relative to the housing, the rearwardly extending cylindrical member being normally resiliently urged in a forward direction for providing forward motion of the mechanism, and being lockable by rotation of said tube in a rearward location relative thereto for providing rearward motion of the mechanism.

4,618,008

VERTICAL DRILLING METHOD AND APPARATUS

Martin D. Cherrington, 8600 Emperor Dr., Fair Oaks, Calif. 95628

Filed Aug. 21, 1984, Ser. No. 642,864
Int. Cl.[4] E21B *21/00, 4/00*
U.S. Cl. 175—65 **19 Claims**

1. A method for drilling a vertical hole from an underground chamber to the earth's surface comprising the steps of:

providing an underground chamber at a depth below the earth's surface;

providing an original hole from the surface to said chamber, through said chamber and below said chamber a distance at least equal to the depth of said chamber;

providing said original hole with a drill string to occupy the portion of the original hole below said chamber;

providing a rock cutting bit on the uppermost end of said drill string;

providing a means to lift said drill string from the portion of the original hole below said chamber to the portion of the original hole above said chamber;

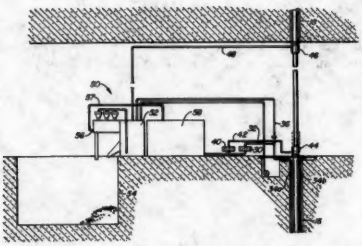
providing a means to power said rock cutting bit; and

lifting said drill string and powering said rock cutting bit from the portion of said hole below said chamber to the portion of said hole above said chamber whereby said drill string drills along the path of said original hole above said chamber.

14. An apparatus for drilling a vertical hole comprising:

an underground chamber;

a vertical hole defined in the ground immediately above said chamber, through said chamber, and below said chamber a distance at least equal to the depth of said chamber;



a drill string mounted in said vertical hole below said chamber;

a rock cutting bit disposed on the upper end of said drill string for confrontation to the portion of said hole above said chamber;

means for powering said rock cutting bit within said chamber; and,

means for raising said drill string while said means for powering said rock cutting bit powers said rock cutting bit to enable a hole to be drilled from the chamber to the surface.

4,618,009

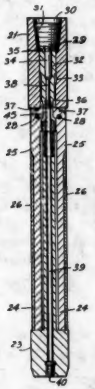
REAMING TOOL

Thurman B. Carter, Tuttle; Carl D. Reynolds, Oklahoma City, both of Okla., and Larry R. Mundorf, Bakersfield, Calif., assignors to Homco International Inc., Houston, Tex.

Filed Aug. 8, 1984, Ser. No. 638,700

Int. Cl.[4] E21B *9/26*

U.S. Cl. 175—267 **24 Claims**



1. An apparatus for reaming a hole drilled in the earth comprising:

(a) a rotatable tool body;

(b) a plurality of high strength elongated cutter arms having an upper end and a lower end, said cutter arms pivotably mounted on said rotable tool body at the upper end of each cutter arm and adapted to be removed outwardly and upwardly; and

(c) said cutter arms comprised of a high impact steel having a Rockwell C hardness of at least about 44 to 62 whereby said cutter arms fracture prior to undergoing a permanent deflection.

22. A method for reaming a hole drilled in the earth from a diameter of about the outside diameter of a reamer tool body having a diameter of up to seven inches to essentially a constant diameter of at least five times the diameter of said reamer tool body in an upwardly or downwardly direction comprising:

(a) lowering a reamer tool having a plurality of cutter arms having cutting surfaces on upper and lower surfaces of said cutter arms into a hole to the location where the diameter of said hole is to be expanded;

(b) flowing drilling fluid under pressure to said reamer tool whereby the cutter arms of said reamer tool extend outwardly;

(c) rotating said reamer tool whereby said cutter arms cut into a formation and continue to extend outwardly and upwardly;

(d) cease rotating said reamer tool when said cutter arms have extended to predetermined angle from the body of said reamer tool; and

(e) rotate said reamer tool while applying a downward force to cut the formation downwardly to essentially a constant diameter.

4,618,010

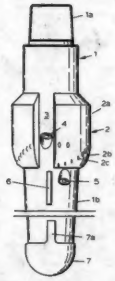
HOLE OPENER

Thomas E. Falgout, Sr., Lafayette, and John W. Hester, Houma, both of La., assignors to Team Engineering and Manufacturing, Inc., Youngsville, La.

Filed Feb. 18, 1986, Ser. No. 830,181

Int. Cl.[4] E21B *7/28, 10/26, 10/56, 10/60*

U.S. Cl. 175—329 **11 Claims**



1. A well bore opener usable at the lower end of a drill string conducting a flow of fluid down through the bore, to increase the diameter on an existing pilot hole, apparatus comprising:

(a) an elongated body having an upper end adapted to threadedly engage the lower end of the drill string;

(b) a generally cylindrical region on said body and an extension tapering smaller to a rounded nose on the lower end, and a generally central fluid conducting channel extending from end to end;

(c) a stabilizer comprising a diametral enlargement of said body with an upper generally cylindrical region and a congreve form generally tangential with said cylindrical region and terminating on said body extension, said stabi-

lizer being divided into three stabilizer pads by grooves extending in a generally axial direction;

(d) an array of poly-crystalline diamond compact cutters affixed to said congreve stabilizer region and extending some radial distance from said congreve surface on each pad;

(e) a plurality of jet nozzles situated in holes extending from said body bore through the body wall located at least one in each of said grooves and directed outward and downward from the surface of said groove;

(f) a plurality of jet nozzles situated in holes extending through the wall of said body, at least one directed upward and outward to provide a fluid jet to impinge on each of said congreve form of said stabilizer pads;

(g) a plurality of vortex control blades extending radially outward from said body extension below said grooves, one blade being in general registry with each groove, said blades extending some distance in a generally axial direction relative to said body;

(h) a cutting structure comprising hard metal particles attached to said body extension rounded nose with braze metal; and

(i) a generally central jet nozzle terminating said body bore at the surface of said rounded nose.

4,618,011

COMBINATORIAL WEIGHING METHOD WITH PAIRS OF SCALES AND ZERO ADJUSTMENT

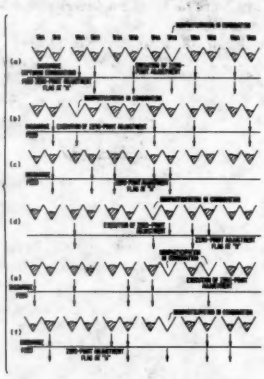
Takashi Sashiki, Nagaokakyo, and Yukio Nakagawa, Kyoto, both of Japan, assignors to Ishida Scales Mfg. Co., Ltd., Kyoto, Japan

Filed Apr. 5, 1985, Ser. No. 720,308

Claims priority, application Japan, Apr. 5, 1984, 59-68288; Apr. 5, 1984, 59-68289; Apr. 5, 1984, 59-68290

Int. Cl.[4] G01G *19/22, 13/14*

U.S. Cl. 177—1 **18 Claims**



1. A combinatorial weighing method for a computerized weighing apparatus including a plurality of pairs of weighing machines for weighing articles supplied thereto and for providing weight value data, and a computation control unit for computing combinations of weight values on the basis of the respective weight value data of the weighing machines to select an optimum combination of the weighing machines, which gives a total combined weight value equal to or closest to a target weight value, and to control the discharge of the articles from the weighing machines corresponding to the optimum combination, said combinatorial weighing method comprising the steps of:

(a) selecting combination patterns which include only one of the two weighing machines in any one pair, and combination patterns which include both weighing machines of a pair for a single one of the pairs;

(b) computing the total combined weight values on the basis of the combination patterns selected in said step (a), and determining the optimum combination; and

(c) a subsequent combinatorial computation with the weighing machines except for at least one of the two weighing machines in a selected pair when both weighing machines are selected together in the optimum combination at said step (b), and executing a zero-point adjustment on the at least one excepted weighing machine.

4,618,012

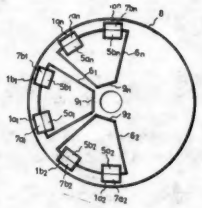
COMBINATION WEIGHING MACHINE

Shoji Yamano, Akashi; Yoshitaka Mikata, Himeji; Osamu Teramoto, Akashi, and Kazuhiro Nishide, Kobe, all of Japan, assignors to Yamato Scale Company, Limited, Japan

Filed Jan. 14, 1985, Ser. No. 691,388

Int. Cl.[4] G01G *19/00, 19/22, 13/00*

U.S. Cl. 177—25 **7 Claims**



1. A combination weighing machine, comprising a plurality of weighing units each adapted for weighing product and producing a weight signal indicative of the weight thereof, a plurality of auxiliary holding hoppers for receiving and holding product weighed by said weighing units, a plurality of memories associated with respective holding hoppers for storing the weight signals corresponding to the contents of said hoppers, means for combining the weight signals from said weighing units and said memories to select a combination of weight signals whose sum satisfies a predetermined weight condition, means for unloading the weighing hoppers and/or holding hoppers corresponding to said selected weight signals, and transfer means responsive to the unloading of said holding hoppers for transferring thereto product from said weighing hoppers and for writing the weight signals of said product in the memories of respective holding hoppers; characterized in that each of said holding hoppers is adapted to receive and hold product from at least two weighing units, and said transfer means is responsive to the unloading of a holding hopper for transferring product thereto from either one of said two weighing units.

4,618,013

COMBINATION WEIGHING MACHINE WITH AUXILIARY WEIGHT HOPPER

Shoji Yamano, Akashi; Yoshitaka Mikata, Himeji; Osamu Teramoto, Akashi, and Kazuhiro Nishide, Kobe, all of Japan, assignors to Yamato Scale Company, Limited, Japan

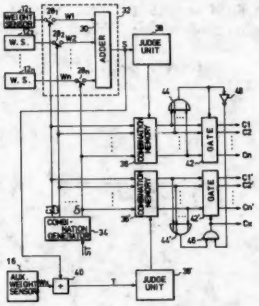
Filed Feb. 4, 1985, Ser. No. 698,087

Int. Cl.[4] G01G *19/22, 13/02*

U.S. Cl. 177—25 **5 Claims**

1. A combination weighing machine, comprising a plurality of main weighing units, means for feeding a quantity of product to each main weighing unit, each main weighing unit being adapted for weighing said quantity of product to produce a main weight signal indicative of the weight of said product, means for generating combinations of said main weight signals to select a combination whose sum satisfies a predetermined

weight condition, and means for unloading the main weighing units of said selected combination; characterized in that said machine further includes at least one auxiliary weighing unit, means for feeding to said auxiliary weighing unit a quantity of product smaller than said quantity fed to a main weighing unit, each auxiliary weighing unit being adapted for weighing said smaller quantity of product to produce an auxiliary weight signal indicative of the weight of said product, means for



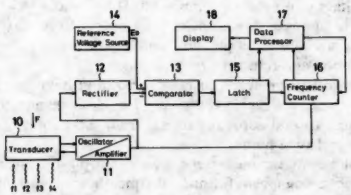
causing said auxiliary weight signal to participate in said combinations, but only when no combination satisfying said predetermined weight condition has been obtained from the combinations of said main weight signals, and means responsive to a combination satisfying said predetermined weight condition obtained from the combinations including said auxiliary weight signal for simultaneous unloading of said auxiliary weighing unit and the main weighing units of said selected combination.

4,618,014

WEIGHT MEASURING APPARATUS OF VIBRATION TYPE

Masaaki Kobayashi, Tokyo, Japan, assignor to Shinko Denshi Company Limited, Tokyo, Japan

Filed Apr. 5, 1985, Ser. No. 720,317
Int. Cl.[4] G01G *3/14, 23/10*
U.S. Cl. 177—210 FP **7 Claims**



1. An apparatus for measuring a weight comprising

a weight transducer of vibration type which vibrates at a frequency determined in accordance with a weight applied to the transducer to produce an oscillation signal having said frequency;

means for receiving the oscillation signal and detecting an abnormal change in the oscillation signal to produce an abnormal signal, said abnormal signal being generated when an amplitude of the oscillation signal is increased abnormally;

means for producing said abnormal signal comprising a rectifier for rectifying the oscillation signal to produce a rectified signal, a reference voltage source for generating a reference voltage, a comparator for comparing the rectified signal with the reference voltage and producing an output signal when the rectified signal is greater than the reference voltage and a latch circuit triggered by the output signal of the comparator to produce the abnormal signal; and

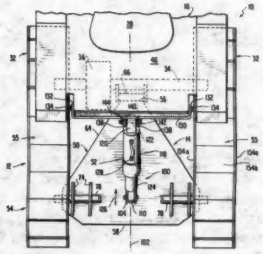
means for discarding the oscillation signal in response to the abnormal signal and deriving a measured weight only from the oscillation signal which is generated from the weight transducer in a normal condition.

4,618,015

REAR SWING ARM ASSEMBLY FOR THREE OR FOUR WHEELED OFF-THE-ROAD VEHICLE TRACK CONVERSION UNIT

Michael Yochum, P.O. Box 3303, Homer, Ak. 99603

Filed Jun. 11, 1985, Ser. No. 743,726
Int. Cl.[4] B62D *55/04*
U.S. Cl. 180—9.21 **7 Claims**



1. A unitary, platelike swing arm assembly for detachable mounting to the rear of a three or four wheeled off-the-road vehicle at its center, said assembly comprising:

a unitary platelike swing arm of generally triangular plan configuration, said swing arm having a front apex end and a rear base end,

means carried by said platelike swing arm at its front apex end for pivotably connecting the front apex end to the rear center of the vehicle for pivoting about a horizontal axis,

means fixedly mounting axle means to said platelike swing arm at said base end, to opposite sides thereof,

auxiliary wheels mounted for rotation about said axle means to opposite sides of said unitary platelike swing arm at positions for alignment with the vehicle rear wheels such that endless track means borne by the vehicle rear wheels and the auxiliary wheels in frictional engagement with the tread portions of the vehicle rear wheels and the auxiliary wheels provide added traction with the track means being driven by the vehicle rear wheels,

and said assembly further comprising a single pivot shock system constituting an air cylinder having one end pivotably mounted to the unitary, platelike swing arm at said base end and centrally between said auxiliary wheels, and means carried by said air cylinder for pivotably mounting the other end thereof to the vehicle chassis at its rear center and in line with the pivot connection at the front apex end of the platelike swing arm to the rear center of the vehicle chassis; such that by a simple two point mounting, the unitary platelike swing arm assembly may be attached and detached readily from the off-the-road vehicle.

4,618,016

MOTOR VEHICLE SUCH AS A TRACTOR

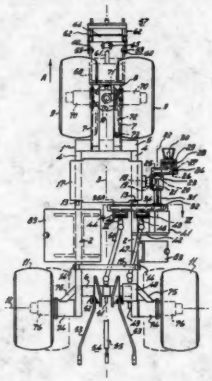
Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Feb. 1, 1984, Ser. No. 576,019

Claims priority, application Netherlands, Feb. 7, 1983, 8300453

Int. Cl.[4] B60K *25/08*; F16H *37/00*

U.S. Cl. 180—53.6 35 Claims



1. A motor vehicle comprising an engine, a frame which supports the engine, forward and rear ground wheels supporting said frame, at least one lifting device and a power take-off shaft which is drivable by the engine and which extends in the intended direction of normal operative travel of the vehicle and is disposed at one side of the vehicle, the power train between said engine and said shaft being disposed between said forward and rear ground wheels as seen from the side, and means for adjusting the lateral position of said power take-off shaft relative to its distance from the vehicle's longitudinal centerline, said power take-off shaft being arranged to extend beyond the vehicle's side so that auxiliary shafts from machines or implements attached to the vehicle and having a working width extending beyond the vehicle can be coupled with said power take-off shaft without being substantially misaligned with said power take-off shaft.

33. A motor vehicle comprising an engine supported by a frame, four ground wheels interconnected to and supporting said frame, a hydraulic pump driven by said engine, separate hydraulic motors driving at least two of said wheels, a hydraulic circuit from said pump to said motors, valve means in said hydraulic circuit controllable by the operator of the vehicle which is adapted to supply hydraulic fluid to each said motor for operating same selectively either in series to prevent wheel slippages under unfavorable soil conditions or in parallel for normal operations.

34. A motor vehicle comprising an engine supported by a frame, forward wheels and rear wheels interconnected to and supporting said frame, a power take-off shaft drivable by said engine extending from one side of the tractor between said forward and said rear wheels on that side, said power take-off shaft being adapted to drive implements connected to the vehicle and extending normally outboard relative to that side of the vehicle, a fuel tank for said engine supported by said frame on the other side of said tractor, said fuel tank being spaced outboard from the tractor's longitudinal centerline and entirely located on said other side which is opposite to said one side on which said power take-off shaft is located and which is between said forward and said rear wheels on such other side.

4,618,017

HYDRAULIC AUXILIARY POWER STEERING FOR MOTOR VEHICLES

Karl-Heinz Liebert, and Erwin Wiedemann, both of Schwäbisch Gmünd, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

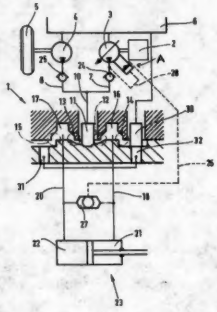
PCT No. PCT/EP83/00301, § 371 Date Nov. 21, 1984, § 102(e) Date Nov. 21, 1984, PCT Pub. No. WO84/03674, PCT Pub. Date Sep. 27, 1984

PCT Filed Nov. 15, 1983, Ser. No. 676,394

Claims priority, application PCT Int'l Appl., Mar. 23, 1983, EP83/00088

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—133 6 Claims



1. In a dual pump booster open circuit system having a double acting booster cylinder (23) with a pair of pressure chambers (21, 22) and comprising a vehicle driven pump (4) operating responsive to vehicle speed for providing pressure flow for booster steering; and an engine driven standby pump (3); including a manually operable steering control valve (1) through which discharge passes in neutral position to a sump:

the improvement which comprises:

said engine driven pump being a variable displacement pump and having pressure operable actuating means (A) movable in opposite directions to vary output from zero output to a volume and pressure suitable for booster steering operation and return to zero output;

said control valve when in neutral position having a flow restriction means (12, 13) to effect a pilot pressure therethrough to said actuating means from the output of said vehicle driven pump;

hydraulic circuitry means conveying said pilot pressure to said actuating means for normally maintaining zero output of said variable displacement pump during or above a predetermined vehicle speed;

connection means (28) from said variable displacement pump to said actuating means for conveying pressure from said latter pump to said actuating means;

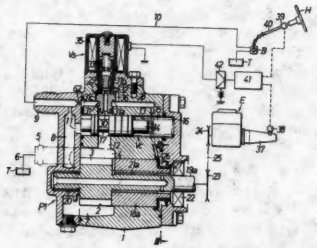
including a comparator valve (27) connected between the pressure chambers of a booster cylinder, said hydraulic circuitry means having connection means (26) to said actuating means effective to communicate pressure thereto from said comparator valve upon a rise or fall in pressure in either pressure chamber;

whereby a drop in pressure to said actuating means from either chamber causes said variable displacement pump to provide a booster steering output at vehicle speeds below said predetermined speed and whereby a rise in pressure to said actuating means from either pressure chamber restores zero output.

4,618,018
POWER STEERING DEVICE FOR VEHICLES

Yoshihiko Toshimitsu, Asaka; Tokuro Takaoka, Tokyo; Toshitake Kawai, Kawagoe, and Takashi Ishida, Kawaguchi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1985, Ser. No. 714,333
Claims priority, application Japan, Mar. 29, 1984, 59-61872
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—142 **5 Claims**



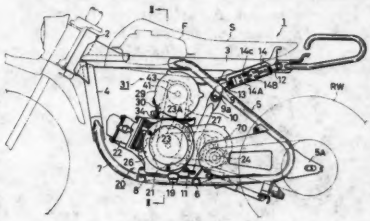
1. A power steering device for supplementary power for the steering of vehicles, said power steering device comprising a hydraulic pump, said hydraulic pump including a pump casing, a rotary shaft having an axis, a pump chamber defined in said pump casing, and a suction port and a discharge port, wherein a pressure member is provided in said pump casing on at least one axial side of said rotary shaft and constitutes an inner side wall of said pump chamber, said pressure member being movable along the axis of said rotary shaft; a hydraulic chamber on a side of said pressure member opposite said pump chamber, said hydraulic chamber faces an end portion of said pressure member and communicates with said discharge port of said hydraulic pump; an electromagnetic change-over valve for interconnecting said hydraulic chamber and said suction port of said hydraulic pump; detector means for sensing at least one of the speed and the steering angle of said vehicle; and means interconnecting said detector means and said electromagnetic change-over valve for actuating said valve and interconnecting said hydraulic chamber and said suction port when said at least one of the speed and the steering angle detected by said detector means passes a limit predetermined to indicate that supplementary power for steering is not required.

4,618,019
MOTORCYCLE

Junji Ando, Tokyo, and Yoshihisa Hirose, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1985, Ser. No. 692,440
Claims priority, application Japan, Feb. 17, 1984, 59-28205; Feb. 17, 1984, 59-28206; Feb. 17, 1984, 59-28207; Feb. 17, 1984, 59-28208
Int. Cl.[4] B62K *11/00*
U.S. Cl. 180—219 **4 Claims**

1. In a motorcycle equipped with an engine having a first built-in dynamo, said motorcycle including:
- a second dynamo in addition to said first dynamo, said second dynamo being outside of said engine;
- a driven shaft connected to a rotor shaft of said second dynamo;
- a driven rotary member relatively rotatably mounted on said driven shaft;
- a driving rotary member in said engine and adapted to drive said driven rotary member;
- a connecting member mounted on said driven shaft in such a manner as to be slidable in the axial direction thereof and rotatable therewith, said connecting member being adapted to be engaged with and disengaged from said driven rotary member; and
- an actuating member connected to said connecting member through a bearing, said actuating member being displac-

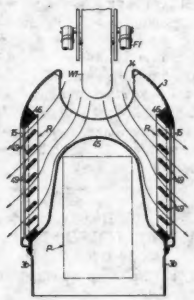


able in the axial direction of said driven shaft but unrotatable, said connecting member being engaged with or disengaged from said driven rotary member in accordance with the displacement of said actuating member in said axial direction.

4,618,020
MOTORCYCLE

Azusa Noda, Tokyo, and Tadashi Kamiya, Niiza, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1980, Ser. No. 156,857
Claims priority, application Japan, Jun. 6, 1979, 54-70784; Jun. 6, 1979, 54-70785
Int. Cl.[4] B60K *11/02, 11/04, 11/08*
U.S. Cl. 180—229 **3 Claims**

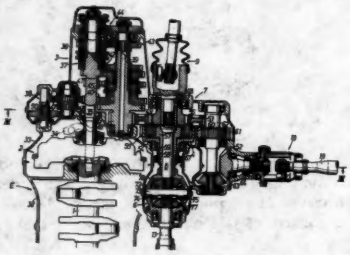


1. A two-wheeled motorcycle comprising:
- (a) a rear-wheel driving power unit arranged between the front and rear wheels of the vehicle;
- (b) a cowling structure of thin sheet material covering said power unit and formed at the front thereof with an air inlet opening and including a right and a left side section, each formed therein with an air outlet opening in a side surface thereof;
- (c) an air-flow dividing guide plate interconnecting said right and left side sections of said cowling structure, defining in the latter a bifurcated air passage duct extending between said air inlet opening and said air outlet openings; and
- (d) a pair of right and left radiators connected with said power unit and arranged in the respective leg portions of said bifurcated air passage duct positioned in said air outlet openings in the opposite side surfaces of said cowling structure.

4,618,021
DRIVING GEAR FOR FRONT AND REAR WHEELS OF AUTOMOBILE

Noboru Ashikawa, Sayama, and Shunji Sakuma, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 6, 1984, Ser. No. 568,842
Claims priority, application Japan, Jan. 18, 1983, 58-6233
Int. Cl.⁴ B60K *17/344*
U.S. Cl. 180—248 **4 Claims**

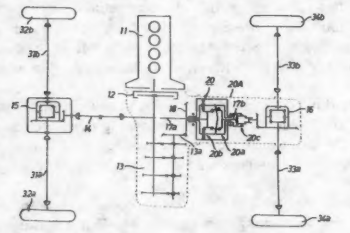


1. A driving gear for front and rear wheels of an automobile, comprising an engine with a crank shaft disposed in a direction of width of a body of the automobile, a transmission supported on an engine case at one side axially of said crank shaft, a clutch provided between the engine and the transmission, a first differential gear of a planetary gear type coupled to the transmission via a reduction gear, a second differential gear of a bevel gear type transmission an output of the first differential gear to left and right front wheels of the automobile, a third differential gear transmitting an output of the first differential gear to left and right rear wheels of the automobile, wherein the first differential gear is disposed adjacent to said reduction gear and comprises a sun gear, a ring gear and a plurality of planet gears engaging with the sun and ring gears, said planet gears being pivoted directly on and driven by said reduction gear; the first and second differential gears are provided on opposite sides of a plane perpendicular to said crankshaft and including said clutch, said first and second differential gears also lying along a common axis parallel to said crank shaft; the sun gear and the ring gear are coupled individually to said front and rear wheels respectively.

4,618,022
POWER TRANSFER DEVICE FOR FOUR-WHEEL DRIVE VEHICLE

Hideyuki Hayashi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jan. 14, 1986, Ser. No. 818,688
Claims priority, application Japan, Jan. 16, 1985, 60-5399
Int. Cl.⁴ B60K *5/04, 17/34*
U.S. Cl. 180—249 **7 Claims**



1. A power transfer device for a four-wheel drive vehicle having a transmission drivingly connected to a prime mover of the vehicle and having a set of front road wheels and a set of rear road wheels adapted to be driven from said transmission, said transfer device comprising:

a first differential of the bevel gear type including a differential case arranged to be applied with drive torque from said transmission, a pinion gear rotatably mounted within said differential case, and a pair of side gears rotatably mounted within said differential case and in mesh with said pinion gear;

a first output shaft connected to one of said side gears for driving the front or rear road wheels;

a second output shaft connected to the other side gear for driving the rear or front road wheels;

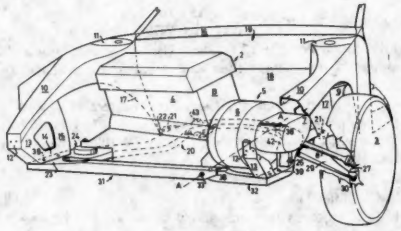
a second differential of the planetary gear type including a differential carrier formed to contain said differential case therein, a carrier rotatably mounted within said differential carrier and connected with said differential case for rotation therewith about a common axis, a sun gear integral with said side gear connected to the first output shaft, a planetary gear rotatably supported by said carrier and in mesh with said sun gear, a ring gear integral with the inner wall of said differential carrier and in mesh with said planetary gear, said carrier being drivingly connected to an outupt shaft of said transmission; and

a selector mechanism arranged to selectively provide a drive connection between said second output shaft and said rear or front road wheels or a drive connection between said differential carrier and said rear or front road wheels.

4,618,023
ARRANGEMENT IN A VEHICLE WITH A DRIVE UNIT MOUNTED IN A SUBFRAME

Stig I. Norlin, Kungshamn, Sweden, assignor to Saab-Scania Aktiebolag, Sodertalje, Sweden

Filed Dec. 6, 1984, Ser. No. 678,973
Claims priority, application Sweden, Dec. 8, 1983, 8306768
Int. Cl.⁴ B62D *21/00*
U.S. Cl. 180—312 **11 Claims**



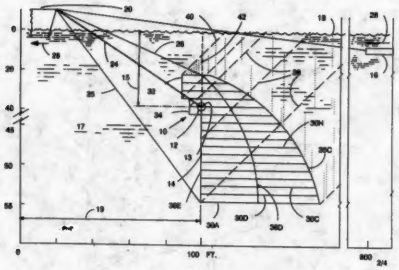
1. Arrangement in a motor vehicle of the passenger car type having a drive unit mounted on a subframe, which subframe is removably attached to carrying parts in the vehicle via attachment elements, and which comprises a first and a second subframe part, characterized in that the subframe parts are articulated in relation to each other about at least two pivoting joints, said joints being separately positioned along a substantially horizontal axis, whereby said first subframe part can be caused to swing into a position allowing fitting and removal of parts of the drive unit.

4,618,024

MOVING SEISMIC SOURCE SYSTEM FOR USE IN WATER-COVERED AREAS

Samuel N. Domenico, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Feb. 28, 1983, Ser. No. 470,664
Int. Cl.[4] G01V *1/04*; H04R *1/02*
U.S. Cl. 181—120 **4 Claims**



1. An apparatus which can easily be moved through water for both reflecting acoustic wave energy in a downward direction and attenuating upwardly and horizontally traveling acoustic wave energy produced by a seismic source used in a body of water wherein the seismic source and seismic sensor means are both moved substantially horizontally through a body of water comprising:

gas releasing means interposed in the water between the seismic source and the seismic sensor means and between the seismic source and the surface of the water for releasing gas bubbles into the water wherein gas releasing means comprises a plurality of coaxial concentric pipes arranged vertically with spaces between adjacent pipes in the shape of at least a radial sector of a paraboloid, with a vertical axis of the paraboloid through the seismic source, each of said pipes having a plurality of perforations; and

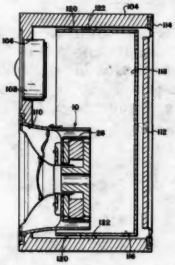
means to supply said pipes with pressurized gas.

4,618,025

ACOUSTICAL DUCTING FOR SPEAKERS AND ENCLOSURES

Dan R. Sherman, 4235 S. Oswego, Tulsa, Okla. 74135

Filed Sep. 15, 1980, Ser. No. 187,510
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—148 **5 Claims**



1. In an acoustical speaker having a movable diaphragm, an improvement comprising

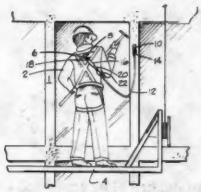
a first cylindrical housing, a first end of which surrounds the diaphragm and which is of a predetermined length, the second end terminating rearwardly of the diaphragm, a second cylindrical housing disposed concentrically within the first cylindrical housing, a rear end of which is coterminous with the second end of the first cylindrical housing to form an annular duct of predetermined cross-sectional area less than that of the diaphragm for acoustically isolating the diaphragm, for dampening ringing of the diaphragm and for extending the frequency range of the speaker at low frequencies.

4,618,026

APPARATUS AND METHOD FOR PRODUCING A COUNTERACTING FORCE

Wayne L. Olson, Evergreen, Colo., assignor to Rose Manufacturing Company, Englewood, Colo.

Filed Sep. 27, 1985, Ser. No. 781,402
Int. Cl.[4] A62B *35/00*
U.S. Cl. 182—4 **28 Claims**



1. Apparatus for applying a counteracting force comprising:

at least one elongated strip of webbing;

at least one portion of said at least one elongated strip of webbing folded over in superposed relationship to form first superposed sections;

means for securing said first superposed sections together in said superposed relationship;

means extending from one end of said first superposed sections for securing said one end to a first object;

at least one separating means located in said means extending from one end of said first superposed sections and positioned so that said separating means can pass between said first superposed sections;

means for securing said at least one separating means to a second object; and

means for producing a force causing relative movement between said first and second objects in a direction away from one of them, said force being of sufficient magnitude so that said first superposed sections will be pulled over said at least one separating means and said at least one separating means will pass between said superposed sections and separate successive parts of said securing means of said first superposed sections to form first separated superposed portions of said first superposed sections and to generate a counteracting force until said force causing the relative movement between said first and second objects has been overcome and said relative movement has been stopped.

4,618,027

FOLDING LADDER WITH THREE STILES

Giancarlo Piretti, Bologna, Italy, assignor to Castilia S.p.A., Italy

Filed Oct. 22, 1985, Ser. No. 790,016
Claims priority, application Italy, Jan. 14, 1985, 52842/85[U]
Int. Cl.[4] E06C *1/383*
U.S. Cl. 182—35 **10 Claims**

1. A ladder comprising:

a pair of main stiles;

a series of rungs with central hinges and ends articulated to the two main stiles, whereby the ladder can adopt a folded inoperative configuration in which the main stiles are alongside each other and an extended operative configura-

tion in which the main stiles are spaced from each other, and

means for stopping the ladder in the extended operative configuration,

wherein the main stiles are articulated together at their upper ends about an axis and the ladder further includes a single

auxiliary stile articulated at its upper end to the two upper ends of the main stiles about an axis substantially perpendicular to the articulation axis of the two main stiles, the auxiliary stile being movable between a position alongside the two main stiles, corresponding to the folded inoperative condition of the ladder, and a position spaced from the main stiles, corresponding to the extended operative condition of the ladder.

4,618,028

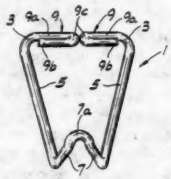
TREE STEP

Jerry D. Dale, 48 N. Lincoln St., Cottage Hills, Ill. 62018

Filed Dec. 23, 1985, Ser. No. 812,825

Int. Cl.[4] A63B *29/04*; A01M *31/00*

U.S. Cl. 182—92 **24 Claims**



1. A tree step comprising a frame and means for securing the frame to a tree, said means comprising a pair of hooks on the frame, each hook having a mouth for entry into a space bounded by the hook, and a line secured at one end to the frame having an intermediate reach adapted to encircle the tree and a free end reach adapted to be wound a plurality of times around the hooks, with each wind of line passing through the mouths of the hooks into said hook spaces, the mouth of at least one hook being sufficiently narrow to permit passage therethrough of only one diameter of line at a time whereby after said free end reach of line is wound around the hooks, said frame may be moved relative to the tree to effect passage of a portion of said intermediate reach of line through the mouth of said one hook to a position in said hook space blocking passage of said end reach back out through said mouth thereby to prevent the line from unwinding from the hooks.

4,618,029

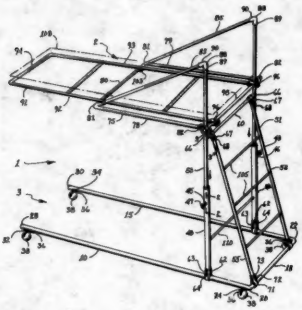
ADJUSTABLE APPARATUS AND METHOD FOR ASSISTING IN MOTOR VEHICLE ENGINE REPAIR

Ron Lowry, 935 E. Vermont Ave., Phoenix, Ariz. 85016

Filed Jun. 3, 1985, Ser. No. 740,757

Int. Cl.[4] B25H *5/00*

U.S. Cl. 182—116 **12 Claims**



1. An adjustable apparatus for aiding a motor vehicle engine repairman, comprising:

a lower support means for supporting said apparatus having a plurality of wheel means therebelow for allowing said lower support means to be easily moved underneath said motor vehicle;

an intermediate support means removably attached to said lower support means for adjusting said apparatus vertical position;

an upper support means removably attached to said intermediate support means and generally parallel to said lower support means for supporting said repairman in repairing said engine of said vehicle, said upper support generally comprising a u-shaped brace member and a mechanic support member removably attached to said intermediate support means;

at least a pair of angularly extending member means having a plurality of struts attached therebetween for allowing said repairman to ascent onto said upper support means, said angularly extending member means suitable for removably attaching to said lower and intermediate support means; and

a pad means removably mounted on said mechanic support member.

4,618,030

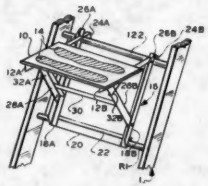
LADDER PLATFORM

Guy A. Campbell, 1326 S. Main St., Phillipsburg, N.J. 08886

Continuation-in-part of Ser. No. 456,582, Apr. 11, 1983, abandoned. This application Aug. 14, 1984, Ser. No. 641,343

Int. Cl.[4] E06C *7/16*

U.S. Cl. 182—121 **9 Claims**



1. A platform for a ladder having rungs, comprising:

a frame arranged to detachably attach to an intermediate one of the rungs of said ladder;

a step means hingeably mounted to said frame for providing a footrest, said step means being sized to swing upwardly and allow a foothold between said step means and said frame, said foothold being supported by said intermediate one of said rungs; and

catch means coupled between said frame and said step means for preventing the step from folding downwardly against the frame and for allowing the step means to swing upwardly, said catch means including:

(a) at least one strut pivotally mounted to said frame and extending upwardly toward the underside of said step means for supporting it; and

holding means for urging said strut upwardly with said step means to allow said strut to fold against said ladder substantially parallel thereto.

4,618,031

INSTALLATION AND METHOD FOR SUPPLYING MERCHANDISE TO SALES DISPLAY STRUCTURES

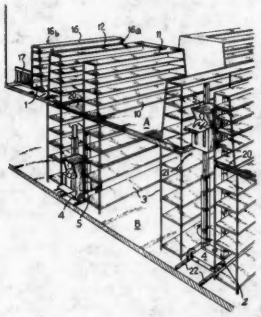
Alain Belloche, 9, avenue du Mail, 35000 Rennes, France

Filed Dec. 28, 1984, Ser. No. 687,477

Claims priority, application France, Jan. 4, 1984, 84 00136

Int. Cl.[4] A47F *10/02*

U.S. Cl. 186—52 **8 Claims**



1. An installation for a self-service shop, comprising at least one sales floor, at least one storage floor, said floors being disposed one above the other, display structures on said sales floor for displaying merchandise for sale, said display structures defining sale areas between them, and said display structures presenting front faces which are accessible for merchandise to be taken therefrom by customers in said sales areas and rear faces which are inaccessible from said sales areas, said structures being restockable through said rear faces, at least one of said floors presenting transfer openings juxtaposed with said rear faces, said installation including transfer means for transferring merchandise from said storage floor to said sales floor through said transfer opening, whereby said display structures may be restocked through said rear faces, wherein said transfer means comprises a platform and motive means for passing said platform through said transfer opening, retracting said platform back through said transfer opening and moving said platform horizontally from display structure to display structure.

4,618,032

TWO BELTED SUPERMARKET CHECKOUT SYSTEM

Robert M. Woolf, Cincinnati, Ohio, assignor to The Kroger Co., Cincinnati, Ohio

Filed Mar. 16, 1984, Ser. No. 590,165

Int. Cl.[4] A47F *9/04*

U.S. Cl. 186—61 **17 Claims**

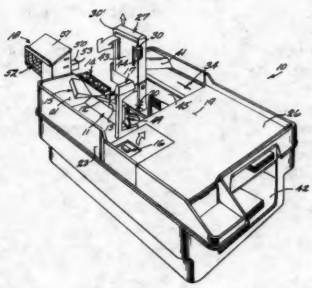
1. A supermarket-type checkout counter comprising:

indicia scanning means for scanning indicia disposed upon goods moved into operative association therewith, said scanning means mounted in a scanner module;

a keyboard;

a cash drawer;

means for defining a workplace at which an operator may be positioned to use said scanning means, keyboard, and cash drawer, said workplace defining means including conveyance means for facilitating conveyance of goods moved into operative association with the scanning means away from the scanning means, said conveyance means including first and second conveyance path means, the first path means disposed along a first side of said workplace and leading to a merchandise accumulation area, and the second conveyance path means comprising first and second moving conveyors disposed at an angle to one another for conveying merchandise along a second side opposite said first side, and behind said workplace and generally perpendicular to said second side and opposite said scanner



module, said second path means also leading to said merchandise accumulation area;

a generally vertical wall portion mounted on the opposite side of said scanner module as an operator positioned in said workplace, said generally vertical wall portion including means defining an open area for receipt of a shopping cart so that items within the shopping cart are readily accessible to an operator standing in the workplace and reaching over the scanner module, and are movable downwardly over the scanner module; and

wherein said scanning means comprises a generally flat plate portion disposed in said scanner module, and wherein said scanner module comprises means for positioning said generally flat plate portion so that it makes an angle in the range of substantially 10°–40° with respect to the horizontal and is angled toward an operator positioned in the workplace, being higher away from said workplace than adjacent said workplace, for facilitating utilization of the scanning means by the operator.

4,618,033

WHEEL STOPPING DEVICE

Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

Filed Nov. 27, 1985, Ser. No. 803,069

Claims priority, application Japan, Dec. 6, 1984, 59-258809

Int. Cl.[4] B62B *9/08*

U.S. Cl. 188—20 **12 Claims**

1. A wheel stopping device wherein first and second wheel means (8 and 9) turnably installed at two different positions on a movable body through first and second wheel attaching members (115 and 116), respectively, and each having at least one wheel (9, 10, 11, 12) are formed with first and second ribs (167 and 66, 67), respectively, projecting from the lateral surfaces of the wheels, the arrangement being such that when first and second engaging members (157 and 57) respectively asso-

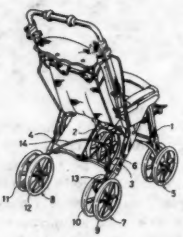
ciated with said first and second wheel means and installed for movement relative to said wheel attaching members engage said first and second ribs, respectively, the first and second wheel means are brought into a wheel stopped state, while when the first and second engaging members become incapable of engaging the first and second ribs, respectively, the first and second wheel means are brought into a wheel rotation permitted state, said wheel stopping device being characterized in that:

said first and second ribs project from portions of the radii of the respective wheels,

said first and second engaging members are respectively formed on the ends of first and second engaging levers (**117** and **17**) which are respectively installed in said first and second wheel attaching members so that they are turnable within a predetermined range, said first and second engaging members being movable only approximately radially of said wheels by the turning of said first and second engaging levers, said radial movement providing states for engagement with and disengagement from said ribs,

a return spring (**110**) is provided for urging said first engaging member (**157**) to be positioned at one end of its range of movement,

a wire (**49**) is connected to said first engaging member through a spring (**111**) which serves to accommodate



excessive tension in said wire, in such a manner as to pull said first engaging member toward the other end of its range of movement against the resilience of said return spring,

an operating member (**13**) is attached to said second wheel attaching member (**15**) so that it is turnable within a predetermined range, said wire extending through a tube (**14**) which is fixed at its opposite ends to said first and second wheel attaching members, said wire being connected to said operating member,

a locking spring (**62**) is connected between said operating member and said second engaging lever (**17**), by the action of which locking spring said operating member and said second engaging lever are urged to turn in opposite directions across their dead position,

the turning of said operating member and said second engaging lever in one direction under the action of said locking spring is effected against the force of said return spring, while the turning thereof in the other direction is effected with the force of said return spring assisting in such turning, and

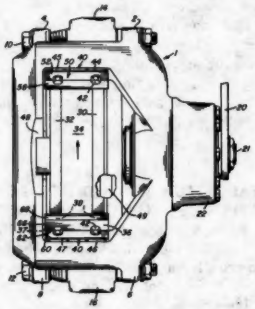
the relation between said engaging members and said ribs is so selected that the operations for said first engaging member to engage and disengage said first ribs (**66, 67**) are operatively associated with the operations for said second engaging member to engage and disengage said second ribs (**167**), respectively.

4,618,034

BRAKE SHOE RETENTION APPARATUS

James L. Weber, West Bloomfield, and Donald J. Davidson, Troy, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 18, 1985, Ser. No. 713,135
Int. Cl.[4] F16D *65/02*
U.S. Cl. 188—73.36 **3 Claims**



1. Apparatus for mounting a pair of brake shoes in a disc brake assembly having a caliper slidably mounted to a support plate comprising,

ledge means in the caliper and its support plate for respectively supporting one of (a) said pair of brake shoes, threaded mounting holes in the caliper adjacent the ends of each said brake shoe for receiving mounting bolts,

the threaded holes in the caliper extending through plate mounting sufaces of the caliper which are at an angle to radially outer surfaces of the brake shoes adjacent said threaded holes,

hold down plates for extending across said radially outer surfaces of said brake shoes and across a rotor receiving area of the caliper, said hold down plates having elongated mounting portions with holes aligned with said threaded mounting holes in the caliper to receive said mounting bolts, said hold down plates having brake shoe contacting portions for contacting said radially outer surfaces of said brake shoes, said mounting portions and said contacting portions of said hold down plates are substantially longitudinally coextensive and angularly related to one another and wherein an angle between the mounting portions and the brake shoe contacting portions of each hold down plate is greater than a corresponding angle between the respective plate mounting surfaces of the caliper and the radially outer surfaces of said brake shoes which are contacted by the contacting portions of said hold down plate wherein bolts extending through the holes in the mounting portions of said hold down plates and into the threaded mounting holes in the caliper resiliently bend the contacting portions of said hold plates thereby resiliently urging said brake shoes into contact with said ledge means.

4,618,035

COLLAPSIBLE AND MOVABLE SUPPORT FOR WARDROBE

James Mao, 2nd Fl., No. 7-3, Jen-Ai Road, Sec. 3, Taipei, Taiwan

Filed Apr. 9, 1985, Ser. No. 721,440
Int. Cl.[4] A45C *5/14*; B62B *1/12*
U.S. Cl. 190—18 A **1 Claim**

1. A collapsible and movable support for wardrobe comprising:

a main frame comprising a pair of frames parallel to each other, each of said frame consisting of a first, a second and

a third hollow tubes, said third tube provided at the lower end with a first hole, a first spring-loaded ball received in said third tube capable of projecting from said first hole thereof, a first circular flange formed in the outer wall of said third tube slightly above said first hole thereof, said second tube furnished at the upper end with a second hole corresponding to said first hole and said first spring-loaded ball of said third tube, a second circular flange corresponding to said first circular flange being formed in the inner wall of said second tube slightly above said second hole thereof, said third tube with a smaller diameter and a shorter length in contrast to said second tube capable of being connected at the lower end to the upper end of said second tube, said second tube further provided at the lower end with a third hole, a second spring-loaded ball received in said second tube capable of projecting from said third hole thereof, a third circular flange formed in the outer wall of said second tube slightly above said third hole thereof, said first tube furnished at the upper end with a fourth hole corresponding to said third hole and said second spring-loaded ball of said second tube, a fourth circular flange corresponding to said third circular flange being formed in the inner wall of said first tube slightly above said fourth hole thereof, said second tube with a smaller diameter and a shorter length in contrast to said first tube capable of being connected at the lower end to the upper end of said first tube, said first tube further provided near said fourth hole thereof with a slot;

a first handle secured to the top ends of said third tubes of said frames;

a first transverse means provided at the central portion with a socket secured to the upper ends of said third tubes slightly below said first handle;

a supporting bar secured to the lower end of one of said first tubes and extending upwardly to a predetermined distance;

a second transverse means secured to both the upper end of said supporting bar and the upper end of the other one of said first tubes;

a fixing means comprising a plate member and a pair of sleeves formed at the both sides of said plate member, each of said sleeves provided at the margins of both ends with a first recess and a second recess respectively corresponding to said first and second spring-loaded balls and at the periphery with an aperture corresponding to said slot of said first tube, a screw capable of passing through said aperture and being inserted into said slot, said fixing means capable of being movably disposed on the intersections of said first and second tubes of said main frame and above said second transverse means thereof;

a bottom plate to which the lower ends of said first tubes are secured comprising a first fixing plate capable of being secured to the upper side of said bottom plate and a pair of wheels disposed on both sides of the underside of said bottom plate;

a supporting means pivotally connected to the rear side of said bottom plate and opposite to said wheels comprising a pair of parallel arms pivotally joined to the rear side of said bottom plate, a first leg fixedly secured to the rear side of the underside of said bottom plate and opposite to said wheels, a second leg pivotally connected to said arms and opposite to said first leg and a connecting bar connected between said first and second legs;

a wardrobe comprising a main body, a supporting plate disposed on the inner wall of the top of said main body, a hook member corresponding to said socket of said first transverse means of said main frame being secured to the top of said supporting plate, the bottom face of said main body provided with a plurality of fixing holes through which a plurality of corresponding fastening means may pass and the front cover thereof provided with at least one zipper to open or close said front cover and the rear face thereof furnished on the upper outer wall with a plurality of pockets and on the lower outer wall with a receiving pocket, a second handle disposed on the middle portion of the outer wall of said rear face, a second fixing plate disposed on the inner wall of said rear face and corresponding to said second transverse means of said main frame, said wardrobe capable of being secured to said main frame and said bottom plate.

4,618,036

HYDRAULIC CONTROL SYSTEM FOR LOCK-UP CLUTCH OF TORQUE CONVERTER

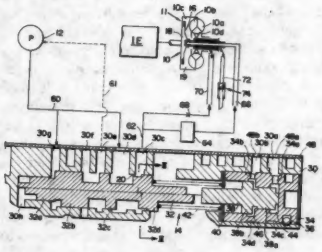
Yasufumi Ideta, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 17, 1984, Ser. No. 641,586

Claims priority, application Japan, Oct. 14, 1983, 58-190879

Int. Cl.[4] F16D *47/06*

U.S. Cl. 192—3.3 **5 Claims**



1. A hydraulic control system for an automatic transmission of an automotive vehicle having an engine, comprising:

a pump driven by the engine to discharge hydraulic fluid;

a torque converter including a torque converter cavity, an impeller, and a turbine which are disposed in said torque converter cavity,

the torque converter including a lock-up clutch which has a lock-up clutch piston movably disposed within said torque converter cavity to divide same into a lock-up release chamber and a working chamber in which said impeller and said turbine are disposed;

a line pressure regulator valve connected to said pump to regulate the hydraulic fluid discharged by said pump and generate a line pressure, said line pressure regulator valve having a port, said line pressure regulator valve including means for establishing a fluid communication path between said port and said pump when said line pressure is higher than a predetermined value to allow a portion of the hydraulic fluid discharged by said oil pump to flow to said port;

means communicating with said port for effecting fluid supply to said lock-up release chamber and said working chamber; and

means for establishing a restricted flow communication path between said port and said pump when said line pressure is less than said predetermined value.

4,618,037

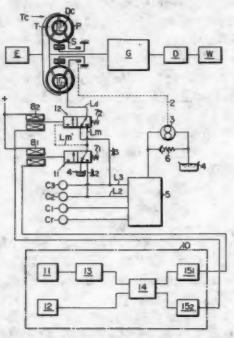
CONTROL DEVICE FOR DIRECT CLUTCH IN AUTOMATIC TRANSMISSION

Masao Nishikawa, Tokyo; Shinzo Sakai, Kamifukuoka, and Junichi Miyake, Hidaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1983, Ser. No. 512,891

Int. Cl.[4] F16D *25/14, 33/00*

U.S. Cl. 192—3.3 **5 Claims**



1. In a vehicle having a vehicular automatic transmission including a fluid torque converter having a pump vane wheel and a turbine vane wheel, a source of working fluid pressure, a working fluid tank, an auxiliary transmission having plural stages of gear trains each having a different gear-to-gear speed ratio and being selectively connectable with an output side of said torque converter, a plurality of hydraulically-operated frictional engagement means each being selectively operable by application thereto of working fluid pressure supplied via corresponding one of a plurality of speed ratio-selecting working fluid passages for actuating a corresponding one of said plural stages of gear trains of said auxiliary transmission, and a hydraulically-operated direct clutch for selectively mechanically coupling together said pump vane wheel and said turbine vane wheel of said torque converter upon application to said direct clutch of working fluid pressure connected to said direct clutch;

a direct clutch control device for controlling engagement of said direct clutch and having a control valve mechanism connected for controlling the supplying of working fluid pressure via said direct clutch working fluid passage to said direct clutch, comprising:

a plurality of branch working fluid passages each connected at one end thereof so as to be in fluid communication with a mediate portion of a corresponding one of said speed ratio-selecting working fluid passages; and

switchable directional control valve means interposed between said plurality of branch working fluid passages and said direct clutch working fluid passages for permitting selective fluid communication between said direct clutch working fluid passages and respective ones of said plurality of branch working fluid passages, said switchable directional control valve means being switchable to respective positions for selectively fluidly communiating said direct clutch working fluid passages with respective ones of said plurality of branch working fluid passages for supplying working fluid pressure from said respective ones of said branch working fluid passages to said direct clutch so as to engage said direct clutch, or with said working fluid tank for discharging working fluid from said direct clutch to said working fluid tank so as to disengage said direct clutch, said switchable directional control valve means comprising a plurality of directional control valves interconnected by intermediate working fluid passage means, at least one of said plurality of directional control valves being so adapted that upon application thereto of working fluid pressure via said intermediate passage means, said at least one directional control valve will operate to supply said applied working fluid pressure via said direct clutch working fluid passage to said direct clutch.

4,618,038

CONTROL APPARATUS OF AN AUTOMATIC TRANSMISSION WITH A LOCK-UP CLUTCH

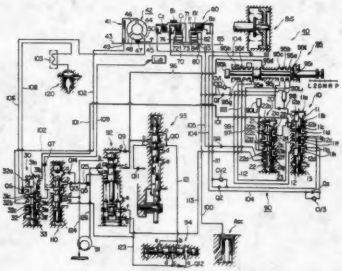
Tsunehiko Ogasawara, Kariya; Yoshichika Arakawa, Nagoya; Koji Sumiya, Nishio, and Yoshikazu Sakaguchi, Anjo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Aisin Warner Kabushiki Kaisha, both of Aichi, Japan

Filed Mar. 1, 1984, Ser. No. 585,127

Claims priority, application Japan, Mar. 31, 1983, 58-56440

Int. Cl.[4] F16H *45/02;* **F16D** *33/16;* **B60K** *41/22*

U.S. Cl. 192—3.29 **7 Claims**



1. A control apparatus in an automatic transmission which defines four speed ranges and includes a fluid pressure source and a lock-up clutch which is lockable in response to a signal pressure to establish the fourth range, said lock-up clutch being lockable solely in the fourth range, said control apparatus comprising:

first and second solenoid valves,

first and second shift valves operably connected to said first and second solenoid valves, respectively, to be shifted thereby into opened and closed conditions,

separate fluid supply passages connecting said fluid pressure source to said first and second shift valves, respectively, and

an interconnecting passage interconnecting said first and second shift valves,

said first and second solenoid valves being independently actuatable such that said first and second shift valves together define four distinct states corresponding to said four ranges, respectively,

said second shift valve being hydraulically operably connected to said transmission in the third of said four states to shift said transmission from said second range to said third range while said first shift valve is hydraulically operably disconnected from said transmission,

said first and second shift valves being interconnected by said interconnecting passage to conduct a fluid flow therebetween in the fourth of said four states such that said first and second shift valves and said interconnecting passage define a signal pressure passage connected to said pressure

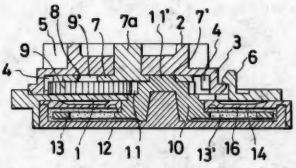
source for conducting said signal pressure to establish said fourth range.

4,618,039

ONE-WAY CLUTCH

Nobuaki Omata, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Apr. 19, 1984, Ser. No. 601,900
Int. Cl.[4] F16D *67/02*
U.S. Cl. 192—4 B **9 Claims**



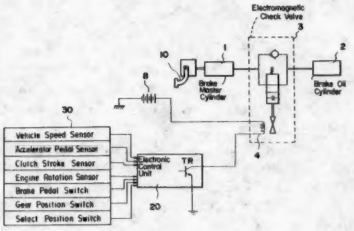
1. A one-way clutch comprising in combination an inner toothed ring having inner teeth, a stationary panel rotatably supporting said inner toothed ring at one side thereof, an output toothed wheel having a shaft passing through a hole in said stationary panel and being pivotally attached to said stationary panel at a position at which said output toothed wheel is not allowed to come into contact with said inner toothed ring, and a planet gear constantly kept in mesh with said inner teeth and adapted to approach and come into engagement with said output toothed wheel, or depart from and break engagement with said output toothed wheel, depending on the direction of rotation of said inner toothed ring.

4,618,040

APPARATUS FOR MAINTAINING VEHICLE BRAKING FORCE

Minoru Honma, Atsugi; Toshihiro Hattori, Ayase; Hideo Saito, Hiratsuka, and Masaki Ishihara, Fujisawa, all of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Jun. 27, 1984, Ser. No. 625,010
Claims priority, application Japan, Jun. 29, 1983, 58-117483; Jun. 30, 1983, 58-118459
Int. Cl.[4] B60K *41/28*
U.S. Cl. 192—0.09 **11 Claims**



1. An apparatus controlled by fluid pressure for maintaining a brake force applied to a vehicle, comprising:

valve means interposed between a master cylinder and a brake wheel cylinder, said valve means being capable of automatically supplying fluid from the master cylinder to the brake wheel cylinder and automatically stopping the supply of fluid from the brake wheel cylinder;

first sensing means for sensing when the vehicle has stopped based on the conditions that the vehicle speed is zero, an engine rpm is not zero, an amount of depression of an accelerator pedal is zero, and a brake pedal is actuated;

second sensing means for sensing when the vehicle begins travelling based on the conditions that a gear transmitting operation is completed, the engine rpm is not zero, the amount of depression of the accelerator pedal is not zero, and the clutch is half engaged; and

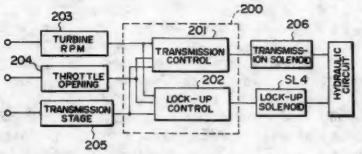
an electronic control means for closing said valve means to maintain the brake force applied to the vehicle when the vehicle has stopped, and for opening said valve means to release the brake force applied to the vehicle when the vehicle begins travelling.

4,618,041

LOCK-UP CONTROL SYSTEM FOR A TORQUE CONVERTER FOR AN AUTOMATIC TRANSMISSION

Kaoru Sotoyama; Shizuo Sumida, and Toshiyuki Kikuchi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed May 24, 1984, Ser. No. 613,611
Claims priority, application Japan, May 27, 1983, 58-93423
Int. Cl.[4] B60K *41/28*
U.S. Cl. 192—0.044 **9 Claims**



1. A torque converter lock-up control system for an automatic transmission comprising a torque converter having input and output shafts, the input shaft being connected to an output shaft of an engine; a multiple stage transmission gear mechanism connected to the output shaft of the torque converter; a lock-up means adapted to be selectively engaged and disengaged to change the power transmission path between the input and output shafts of the torque converter, the lock-up means being adapted to directly connect the input and output shafts of the torque converter when engaged; a lock-up driving means for controlling the lock-up means; a rotational speed sensor for detecting the rotational speed related to one of said input and output shafts of the torque converter and generating a rotational speed signal; an engine load sensor for detecting engine load and generating an engine load signal; lock-up determination means which generates a lock-up signal or a lock-up release signal according to whether or not the operating condition of the engine represented by the rotational speed signal and the engine load signal is in a lock-up zone which is defined by first to third relations, the first relation being preset from a relation which the rotational speed and the engine load are to have with each other when the torque ratio of the engine output torque to the torque converter output torque is substantially 1, the second relation being preset from a relation which the rotational speed and the engine load are to have with each other when the engine output is substantially zero, and the third relation being preset from a lower limit of the rotational speed at which lock-up can be permitted, the lower limit being shifted toward the lower speed side of said rotational speed as the transmission gear mechanism is shifted toward the higher speed stage, and the third relation being changed corresponding to the change in the lower limit of said rotational speed; and control means which generates a control signal for controlling said lock-up driving means to engage or disengage said lock-up means according to the signal generated from, the lock-up determination means.

4,618,042

CONTROL FOR AUTOMATIC TRANSMISSIONS

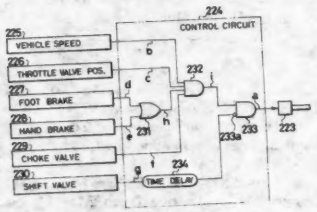
Koichi Yamamoto, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jul. 30, 1984, Ser. No. 635,930

Claims priority, application Japan, Jul. 30, 1983, 58-119544[U]

Int. Cl.[4] B60K *41/28*; F16D *25/061*

U.S. Cl. 192—0.044 **18 Claims**



1. A control system for vehicle automatic transmissions comprising hydraulic actuator means for engaging friction engaging means for establishing a driving gear train, hydraulic conduit means for supplying hydraulic pressure to said hydraulic actuator means, control valve means provided in said hydraulic conduit means to connect the actuator means alternately to hydraulic source means and drain conduit means, pressure reducing valve means provided in said drain conduit means for producing a pressure which is lower than a pressure for making the friction engaging means engage, vehicle speed detecting means for detecting vehicle speed and producing a low vehicle speed signal showing that the vehicle speed is below a predetermined value, position detecting means for detecting position of an engine power control member and producing a position signal when the control member is in a low engine output position smaller than a predetermined position, brake actuation means for producing a brake signal when vehicle brake means is in operation, range detecting means for detecting position of a manually operated shift lever and producing a running range signal when said shift lever is in a running range, valve actuating means for actuating said control valve means, control means for controlling operation of said valve actuating means, said control means being responsive to said low vehicle speed signal, said position signal, said brake signal, and said running range signal for producing a control signal to operate said valve actuating means for moving said control valve means so that the hydraulic actuator means is connected to the drain conduit means when all of said signals are received, said control means including time delay means for applying a time delay to said running range signal so that the control signal is produced after a predetermined delay time when the manual shift lever is moved to a running range.

4,618,043

METHOD FOR AUTOMATIC CONTROL OF A MOTOR VEHICLE CLUTCH

Toshihiro Hattori, Ayase; Masaki Ishihara, Fujisawa; Makoto Uriuhara, Yokohama; Hitoshi Kasai, and Yasuyoshi Asagi, both of Kawasaki, all of Japan, assignors to Isuzu Motors Limited, Tokyo and Fujitsu Limited, Kawasaki, both of, Japan

Filed Jun. 27, 1984, Ser. No. 625,203

Claims priority, application Japan, Jun. 29, 1983, 58-117227

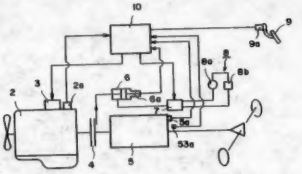
Int. Cl.[4] B60K *41/02*

U.S. Cl. 192—0.052 **8 Claims**

1. A method of controlling the start of a vehicle equipped with an accelerator pedal sensor for sensing an amount of depression of an accelerator pedal, a throttle actuator for controlling an amount of fuel supplied to an engine, an engine rotation sensor for sensing rpm of the engine, a clutch actuator for controlling an amount of engagement of a clutch, a clutch position sensor for sensing the amount of engagement of the clutch, and an electronic control apparatus which receives detection signals from each of said sensors for controlling the throttle actuator and the clutch actuator based on the detection signals, said method comprising the steps of:

(a) sensing the amount of depression of the accelerator pedal by the accelerator pedal sensor;

(b) performing a comparison to determine whether the amount of accelerator pedal depression is greater than or less than a set value;



(c) selecting a very low speed control mode as a start control mode, when the amount of accelerator pedal depression sensed is less than said set value, wherein the clutch is controlled in half-clutch range; and

(d) selecting an ordinary start mode as a start control mode, when the amount of accelerator pedal depression sensed is greater than the set value, during which the clutch is controlled until fully engaged.

4,618,044

WHEEL HUB CLUTCH ASSEMBLY

Motoi Fujikawa, Anjo, and Tooru Kagata, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

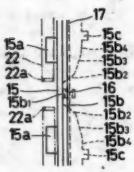
Filed Sep. 11, 1984, Ser. No. 649,375

Claims priority, application Japan, Sep. 26, 1983, 58-148392[U]

The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.

Int. Cl.[4] F16D *43/20*

U.S. Cl. 192—54 **5 Claims**



1. A wheel hub clutch assembly for effecting engagement between a drive axle and a wheel hub in response to rotation of said drive axle, comprising:

a cylindrical body with a first clutch element, the cylindrical body being secured to an outer end of said wheel hub;

a sleeve member fixedly mounted on an outer end of said drive axle for rotation therewith and located within said cylindrical body;

a clutch member with a second clutch element for engagement with said first clutch element, said clutch member being axially slidably mounted on said sleeve member for rotation therewith;

cam means operatively coupled with an outer end of a stationary axle tube for said drive axle and rotatable on said sleeve member, said cam means having at least two stages of cam face rise;

cam follower means axially slidably mounted on said sleeve member for rotation therewith, said cam follower means cooperable with said cam face rise of said cam means to be

displaced toward said clutch member in response to rotation of said drive axle;

a connecting member engaged with said cam follower means and said clutch member, said connecting member permitting relative axial movement between said cam follower means and said clutch member,

a first spring arranged between said cam follower means and said clutch member for loading said cam follower means toward said cam means, said first spring being cooperable with said connecting member for loading said clutch member for movement away from engagement with said first clutch element; and

a second spring arranged in parallel with said first spring between said cam follower means and said clutch member for loading said clutch member for movement toward engagement with said first clutch element, said second spring being cooperable with said connecting member for resiliently providing an axial space between said cam follower means and said clutch member.

4,618,045

FLUID FRICTION CLUTCH

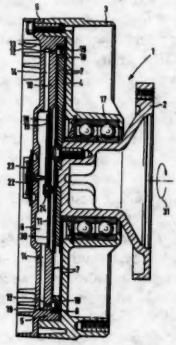
Werner Storz, Bennigen, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlerfabrik, Julius Fr. Behr GmbH & Co. KG, Fed. Rep. of Germany

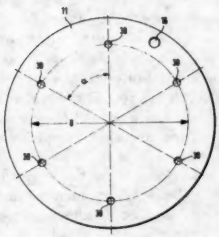
Filed Jul. 24, 1984, Ser. No. 634,038

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1983, 8323498[U]

Int. Cl.⁴ F16D *31/00*

U.S. Cl. 192—58 B **16 Claims**





1. A fluid friction clutch having a working space and a storage space, separated by an intermediate wall in a housing for clutch fluid, said intermediate wall including a controllable inlet opening between said storage space and said working space through which said fluid passes, and further having a driven clutch disk rotatable within said working space; clutch fluid return bore means in said intermediate wall adjacent the outer circumference of said clutch disk for return guidance of said fluid to said storage space, and a plurality of non-controllable overflow openings in said intermediate wall, wherein said non-controllable openings are spaced from one another and evenly distributed in circumferential direction with respect to said intermediate wall to facilitate uniform wetting of the clutch disk, said non-controllable opeings being disposed radially inward of the fluid return bore means.

4,618,046

SHIFTING COUPLING

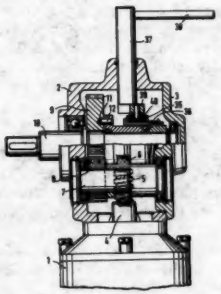
Heinrich Sassen, Rosengarten, Fed. Rep. of Germany, assignor to Zahnradfabrik Altona-Elbe Hans Meyer GmbH & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jan. 30, 1985, Ser. No. 696,359

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1984, 3405038

Int. Cl.⁴ F16D *11/00, 23/14*

U.S. Cl. 192—67 P **7 Claims**



1. A positive-engagement shifting coupling, comprising:

an output shaft;

an output gear wheel, which is freely rotatably mounted on said output shaft and has at least one essentially axially parallel disposed recess;

a cylindrical sliding sleeve, which is mounted on said output shaft in such a way that it is non-rotatable relative thereto, yet can shift position on said output shaft in the axial direction thereof;

a compression spring for urging said sliding sleeve into a disengagement position of said coupling;

a coupling flange which is connected to said sliding sleeve, said coupling flange being provided with at least one essentially axially parallel disposed coupling projection which is adapted to be received in mating engagement with said at least one recess of said output gear wheel to effect said positive engagement when said coupling is in an engagement position;

a counter retaining sleeve, which is mounted on said output shaft in such a way that it is not axially displaceable relative thereto; each of said sliding sleeve and said retaining sleeve has an end which faces the other, and which are adapted in part to butt against one another when said coupling is in said disengagement position; said facing ends of said sleeves are also provided with respective conical surfaces which diverge outwardly, i.e. away from said output shaft, in opposite directions;

control balls, which are disposed between said conical surfaces of said sliding sleeve and said retaining sleeve, and which have a diameter of a magnitude such that in said engagement position of said coupling, with said sliding sleeve shifted as far as possible from said retaining sleeve, said control balls do not extend radially beyond the outer diameter of said sleeves, yet such that in said disengagement position of said coupling, with said sliding sleeve

butting against said retaining sleeve, said control balls do extend radially beyond the outer diameter of said sleeves;

a control sleeve, which is mounted on said sliding sleeve in such a way as to be axially displaceable relative thereto, and which encircles both said sliding sleeve and said retaining sleeve; that portion of said control sleeve which is closer to said coupling flange of said sliding sleeves has a first inner diameter, and that portion of said control sleeve which is remote from said coupling flange has a second inner distance which is greater than said first inner diameter by an amount corresponding to the radial movement of said control balls between said engagement and disengagement positions; a conical transition surface, which is adapted to contact said control balls, is provided between said portion of said control sleeve with said first inner diameter, and said portion of said control sleeve with said second inner diameter;

a control ring, which is disposed on said control sleeve in such a way that it can be axially displaced within certain limits;

a second spring for urging said control ring into said disengagement position; and

a shifting mechanism for displacing said control ring against the force of said second spring for prestressing said control sleeve, and hence said control balls and said sliding sleeve with its coupling flange, in the engagement direction.

4,618,047

FRICTION CLUTCH WITH PIVOTABLE DIAPHRAGM SPRING ON THE CLUTCH COVER

Peter Kinz, Baden-Baden, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Buhl, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,768

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327432; Aug. 27, 1983, 3347801

Int. Cl.[4] F16D *13/50*

U.S. Cl. 192—89 B **31 Claims**

1. A friction clutch, particularly for use in motor vehicles, comprising a diaphragm spring having a first side and a second side and including a circumferentially complete outer marginal portion and an annulus of prongs extending substantially radially inwardly from said marginal portion, said spring further having slots alternating with said prongs and at least some of said prongs having elongated reinforcing portions extending from said second side and radially outwardly beyond the neighboring slots; a cover adjacent to one side of said spring; a first ring-shaped seat provided on said cover adjacent to the first side of said spring in the region of said reinforcing portions; and a second ring-shaped seat provided on said cover adjacent to the second side of said spring opposite said first seat, so that said spring can pivot between said seats, said second seat having arcuate portions each bridging a different one of said reinforcing portions, said spring and said second seat defining clearances intermediate at least some of said arcuate portions of said second seat.

4,618,048

CLUTCH DISK ASSEMBLY

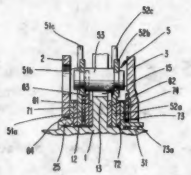
Kiyonori Kobayashi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 23, 1983, Ser. No. 507,016

Claims priority, application Japan, Jun. 29, 1982, 57-112092; Jul. 31, 1982, 57-133868; Jul. 31, 1982, 57-133869

Int. Cl.[4] F16D *3/14*

U.S. Cl. 192—106.2 **10 Claims**



1. A clutch disk assembly comprising a hub member adapted to be coupled to a transmission shaft, a flange member mounted on said hub member for corotation, a drive plate extending parallel to said flange member and rotatable relative to said hub member, a friction lining secured to a radially outward portion of said drive plate, a sub-plate extending parallel to said flange member and arranged axially spaced from said drive plate across said flange member for rotation with said drive plate, spring members mounted in windows defined in said sub-plate, said drive plate, and said flange member and arranged axially across said flange member, said drive plate, and said sub-plate for producing resistive forces against relative rotation of said flange member and said drive plate and said sub-plate, a control member positioned between said flange member and said drive plate and said sub-plate and disposed astride of said flange member through notches defined therein radially inwardly of said windows, said control member being engageable with said drive plate and said sub-plate and rotatable relative to said flange member in a first operative range of relative rotation of said flange member and said drive plate and said sub-plate, and being releasable from engagement with said drive plate and said sub-plate, engageable with said flange member, and rotatable relative to said drive plate and said sub-plate in a second operative range of said relative rotation, a first resistance means including first force exerting means arranged between said control member and said flange member for exerting an axial force that produces a frictional resistive force against relative rotation of said control member and said flange member, and a second resistance means including second force exerting means arranged between said control member and said drive plate and said sub-plate for exerting an axial force that produces a frictional resistive force against relative rotation of said control member and said drive plate and said sub-plate, said first resistance means being operative during said first operative range of relative rotation to create a first hysteresis and said second resistance means being operative during said second operative range of relative rotation to create a second hysteresis, said first resistance means being substantially inoperative in said second operative range, said control member having a rigidity selected to prevent said axial resistive forces exerted by said first and second force exerting means of said first and second resistance means from interfering with each other.

4,618,049

FRICTION PARTNERS FOR LUBRICATED FRICTION COUPLINGS

Hermann Pflaüm, Planegg, and Herbert Vojacek, Munich, both of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

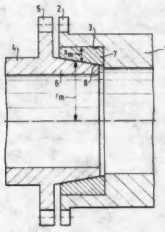
PCT No. PCT/DE82/00120, § 371 Date Feb. 3, 1983, § 102(e) Date Feb. 3, 1983, PCT Pub. No. WO82/04295, PCT Pub. Date Dec. 9, 1982

PCT Filed Jun. 4, 1982, Ser. No. 467,490

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3122522

Int. Cl.⁴ F16D *69/02*

U.S. Cl. 192—107 M **15 Claims**



1. In friction partners for wet lubricated friction couplings in which at least two surfaces are connected by frictional engagement, especially for synchronizing devices for positively-locking gear-shift couplings that consist of at least one synchronizing ring and an equalizing ring the improvement which comprises a first friction partner consisting of a first ceramic material and a second friction partner of a metallic or second ceramic material having a chemical composition different from that of the first friction partner, said first ceramic material being a dense sintered oxide ceramic having a surface which has a high proportion of pores.

4,618,050

DEVICE FOR LOCKING AND RELEASING OBJECTS INTENDED FOR PUBLIC USE, SUCH AS LUGGAGE CARTS

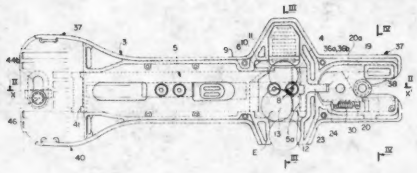
Henri-André Payraudeau, Draguignan, France, assignor to MORS, France

Continuation-in-part of Ser. No. 515,372, Jul. 18, 1983, Pat. No. 4,589,538. This application Oct. 4, 1984, Ser. No. 657,531

Claims priority, application France, Feb. 18, 1983, 83 02716; Apr. 26, 1983, 83 06857; Oct. 7, 1983, 83 16031

Int. Cl.⁴ G07F *7/00*

U.S. Cl. 194—212 **14 Claims**



1. A device for locking and releasing objects intended for public use, especially objects to be put at public disposal free of charge, such as luggage carts in a railway station or an airport or shopping carts in self-service stores, such objects capable of being taken directly from a common storage station and returned to the storage station,

said device including a locking apparatus in the form of a casing and adapted to be affixed to a part of each object,

attaching means for affixing said locking apparatus to a part of each object,

a connecting lock having male and female means secured to respective longitudinal endmost portions of said casing forming said locking apparatus, for locking each object to an adjacent object or to a fixed point in compact storage position, and

a slit provided in said casing through which a coin or the like is introduced to allow unlocking of said locking apparatus and release of the object by exerting a pull thereon,

said locking apparatus being arranged to return the coin or the like when the object is returned to the storage station and is locked by said connecting lock to the adjacent object or to the fixed point,

wherein said female means is constituted by a clamp comprising two unsymmetrical jaws, and said male means is constituted by a connecting bar secured to the object or to the fixed point, and having a diameter perfectly calibrated so that said male means can fit in between said jaws,

wherein said connecting bar secured to the object comprises a first portion in the form of a hollow cylinder and a second portion forming a cylindrical shoulder integral with said first portion,

said portions are mounted on a support arbor removably secured to the endmost portion of said casing of said locking apparatus with the first hollow cylindrical portion having a diameter corresponding to said calibrated diameter to allow said cylindrical portion to fit into a first one of said jaws of the locking apparatus of an adjacent object, the second jaw being so shaped as to allow said second cylindrical shoulder, having a calibrated diameter, to bear thereon, the removal of said support arbor from the endmost portion of said casing permitting direct release of the adjacent object from said object, both forming part of a rank of objects locked to one another, in order to disrupt said rank.

4,618,051

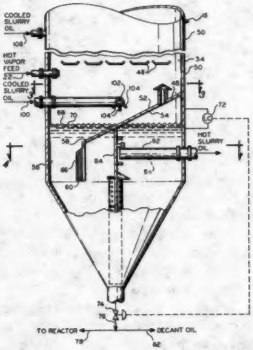
FRACTIONATION METHOD AND APPARATUS

Frank W. Skraba, Sweeny, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 575,112, Jan. 30, 1984. This application May 23, 1985, Ser. No. 737,117

Int. Cl.⁴ B01D *3/42*

U.S. Cl. 196—139 **6 Claims**



1. Apparatus suitable for use in the fractionation of a hot vaporous feed stream, comprising:

a vessel having an upper portion, a lower portion and a medial portion;

fractionation tray means in the medial portion of said vessel for separating fractions of a hot vaporous feed stream;

baffle means in the medial portion of said vessel intermediate said fractionation tray means and the lower portion of said vessel for directing the flow of liquid thereover;

inclined baffle plate means having an upper surface and a lower surface disposed in said vessel below the lowermost portion of said baffle means for directing the flow of liquid thereover;

vertical passage means in said vessel communicating with the lower portion of the upper surface of said inclined baffle plate means for directing the flow of liquid downwardly from said inclined baffle plate means;

first conduit means communicating with the interior of said vessel below said baffle means and above said inclined baffle plate means for introducing a hot vaporous feed stream into said vessel for fractionation thereof;

second conduit means communicating with the interior of said vessel below said inclined baffle plate means for withdrawing liquid from a body of liquid in the lower portion of said vessel;

cooler means interposed in said second conduit means for cooling withdrawn liquid passing through said second conduit means; and

third conduit means communicating between said second conduit means downstream of said cooler means and the interior of said vessel intermediate said first conduit means and the upper surface of said inclined baffle plate means for dispensing cooled liquid from said cooler means onto the upper surface of said inclined baffle plate means to cool hot liquid flowing downwardly over the upper surface of said inclined baffle plate means into the body of liquid in the lower portion of said vessel.

4,618,052

CONVEYING APPARATUS

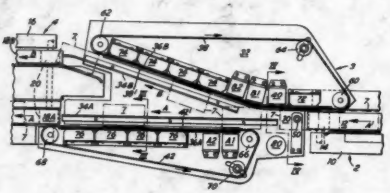
Roger G. Rickett, Turners Hill, and Eric Spooner, Crawley, both of United Kingdom, assignors to Metal Box Public Limited Company, United Kingdom

Continuation of Ser. No. 425,774, Sep. 28, 1982, abandoned. This application Jun. 10, 1985, Ser. No. 742,638

Claims priority, application United Kingdom, Jan. 29, 1982, 8202650

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—370 **7 Claims**



1. Conveying apparatus for conveying a succession of generally cylindrical elongate articles of magnetizable material, axially end-to-end and each in a predetermined orientation about its axis, said apparatus having

a longitudinal means for guiding said cylindrical articles end-to-end and defining a single common path and a plurality of other paths forming a common junction region with the common path;

article-advancing means operatively associated with the various paths for positively driving the articles along said conveyor path, said common path and said other paths;

a controllable magnet means including a controllable master magnet at the junction region providing a magnetic field when activated, the master magnet defining a local region of influence on any said article in the junction region only;

said controllable magnet means further including at least one other controllable magnet located adjacent the entry to each said other path downstream of said master magnet and spaced from said master magnet in a position such that its local region of influence extends into the junction region;

non-changeable magnetic holding means disposed along substantially the whole length of the paths other than said controllable magnet means for exerting a generally radial force on said articles to maintain said articles in said end-to-end relationship guided by said guide means and to positively maintain each article in said predetermined rotational orientation relative to the axis of each article throughout its travel along at least said other paths through the apparatus; and

sequencing means synchronized with the article-advancing means for activating and de-activating said controllable master magnet and said at least one other controllable magnet;

whereby:

(i) energization of the master magnet (**40**) magnetically draws a first said article (y) to said article-advancing means for advancement by said advancing means into the junction region and positions it therein,

(ii) energization of a first of said other controllable magnets (A_1) draws the leading end of said first article (y) to said article advancing means for advancement by said advancing means into a first of said other paths (A) associated with said other controllable magnet, and de-energization of the master magnet (**40**) then controls the approach of the next following one (z) of said articles, and

(iii) when the rear end of said first article (y) has left the junction region, re-energization of the master magnet draws

the leading end of said next article (z) to said article advancing means for advancement by said advancing means into the junction region and positions it therein, and

(iv) energization of a second of said other controllable magnets (B_1) draws the leading end of said next article (z) to said article advancing means for advancement by said advancing means into a second of said other paths (B) associated with said second other controllable magnet.

4,618,053

MECHANISM FOR DELIVERING FASTENER ELEMENTS TO FASTENER-ASSEMBLING APPARATUS

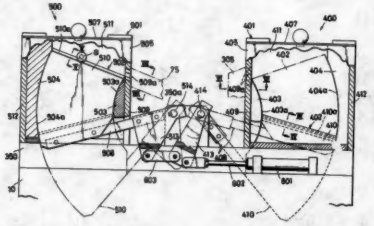
Yukio Taga, Uozu, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,012

Claims priority, application Japan, Dec. 29, 1983, 58-200492

Int. Cl.[4] B65G *47/24, 47/44*

U.S. Cl. 198—389 **2 Claims**



1. A mechanism for successively delivering two different kinds of fastener elements separately to a fastener-assembling apparatus, comprising:

(a) a base having an upwardly directed projection;

(b) a pair of first and second hoppers supported on said base for containing the two different kinds of fastener elements separately, said first and second hoppers being spaced apart from each other along said base with said projection thereof disposed centrally between said first and second hoppers, each of said first and second hoppers having at least one stationary vertical flat inside wall-surface, said first and second hoppers having in their upper portion a first opening, and a second opening, respectively;

(c) a pair of first and second levers pivotally mounted about fixed axis on said projection and interconnected at their free ends by a floating link;

(d) a fluid-actuated cylinder having a piston rod pivotally connected to the free end of said first lever for moving both said first and second levers in timed relation to each other in opposite directions;

(e) a first pick-up operatively connected to said first lever and responsive to pivotal movement thereof to vertically pivot for picking up certain fastener elements of one kind in said first hopper and then for discharging the picked-up fastener elements successively from said first opening;

(f) a second pick-up operatively connected to said second lever and responsive to pivotal movement thereof to vertically pivot for picking up certain fastener elements of the other kind in said second hopper and then for discharging the picked-up fastener elements successively from said second opening; and

(g) a pair of first and second chutes communicating with said first and second openings, respectively, for receiving therefrom the fastener elements of one kind and the fastener elements of the other kind and for delivering such two kinds of fastener elements separately to the fastener-assembling apparatus.

4,618,054

EQUIPMENT FOR FEEDING PACKAGING BLANKS TO A PACKAGING MACHINE

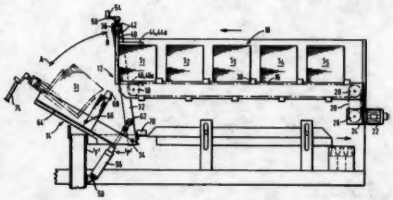
Rolf Muller, Konz, Fed. Rep. of Germany, assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 28, 1984, Ser. No. 675,503

Claims priority, application United Kingdom, Nov. 28, 1983, 8331710

Int. Cl.[4] B65H *1/00*

U.S. Cl. 198—409 **4 Claims**



1. In a packaging machine of the type having a feed hopper for holding a supply of packaging blanks, the arrangement for automatically feeding stacks of such blanks to said feed hopper comprising a feed magazine for supporting and sequentially advancing a series of stacks of packaging blanks to a transfer position adjacent said feed hopper, a transfer mechanism for transferring the leading stack of blanks from said feed magazine to said feed hopper, and means for moving the next stack of blanks to said transfer position, said transfer mechanism comprising a pivotal arm **(32)** mounted for reciprocal movement between said feed magazine **(10)** and said feed hopper **(14)** and including blank support means **(44,46; 44*a*,46*a*)** arranged for receiving and supporting said leading stack of blanks and means for releasing the same when the pivotal arm arrives at the feed hopper to deposit said stack in said feed hopper, said blank support means comprising blank support arms for engaging respectively the uppermost and lowermost blank in said leading stack to be transferred, said means for releasing said stack including means for pivoting said blank support arms out of engagement with said uppermost and lowermost blanks when the stack is positioned in said feed hopper.

4,618,055

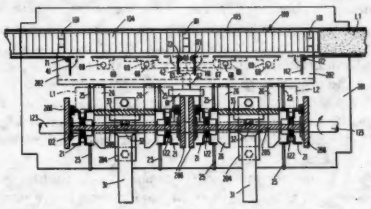
COLLATOR SECTION OF LASAGNA PACKER

Michele L. Porcelli, Palmyra, Pa., assignor to Hershey Foods Corporation, Hershey, Pa.

Filed Jan. 24, 1985, Ser. No. 694,511

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—422 **16 Claims**



12. A collator for articles comprising:

a. an endless collator conveyor positioned for vertical travel, said collator conveyor comprising a succession of shelves for receiving and supporting articles delivered thereto;

b. a narrow belt bulk conveyor for transporting stacks of articles to a packaging station, said bulk conveyor having a front wall which has an opening for receiving stacks of articles;

c. retainer means positioned at said opening and movable between open and closed positions for retaining said stacks of articles on said narrower belt bulk conveyor when in closed positions, said front walls and said retainer means, when in the closed position, providing a boundary for articles on said narrow belt bulk conveyor;

d. push means for pushing articles off the shelves of said collator conveyor;

e. means for moving said push means forwardly to push articles off said collator conveyor shelves and into said opening of said bulk conveyor when said retainer means are in open positions; and

f. means for withdrawing said push means from its forward position.

4,618,056

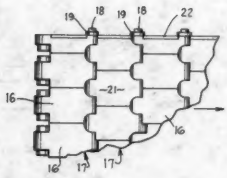
LINK CONVEYOR BELT FOR HEAT TREATING APPARATUS

Robert S. Cutshall, Kalamazoo, Mich., assignor to Omega Castings, Inc., Battle Creek, Mich.

Filed Mar. 23, 1984, Ser. No. 592,654

Int. Cl.[4] B65G *17/06*

U.S. Cl. 198—853 **12 Claims**



1. A one-piece, cast metal link for a conveyor belt as used in heat treating furnaces and the like, comprising:

a central body portion defined by an elongated tubular body which has a closed tubular wall structure defining therein a hollow interior, said tubular wall structure including a substantially planar top wall, a pair of sidewardly spaced sidewalls which are fixed to and project downwardly from the top wall, and a bottom wall which extends between and is fixedly joined to the lower edges of the sidewalls, one of said walls having a small opening formed therethrough for communication with said hollow interior to permit flow of oxygen into said interior;

a first hinge portion fixedly joined to said tubular body at one end thereof, said first hinge portion including a substantially semi-cylindrical first end wall which fixedly extends between said top and bottom walls, said first end wall and said sidewalls cooperating to define a first substantially cylindrical opening which extends transversely of said link in substantially perpendicular relationship to the longitudinal direction thereof, said first opening having a longitudinal axis which extends substantially parallel with the upper surface of said top wall, said first opening being open at opposite ends thereof and accessible from opposite sides of said link, and the hollow interior of said tubular body being in open communication with a central part of said first opening;

a second hinge portion fixedly joined to said tubular body adjacent the other end thereof, said second hinge portion including a second substantially semi-cylindrical end wall which is fixedly joined between said top and bottom walls, said second end wall and said sidewalls cooperating to define a second substantially cylindrical opening which extends transversely of said link and defines a longitudinal axis which extends substantially parallel with the longitudinal axis of said first opening, said hollow interior of said tubular body being in open communication with a central part of said second opening;

said second hinge portion including a pair of cylindrical sleevelike trunnions coaxially aligned with said second opening and projecting outwardly from opposite sides of said tubular body, said trunnions having said second opening projecting outwardly therethrough, said trunnions at their inner ends being fixedly joined to said second end wall and the respectively adjacent sidewall, said trunnions defining thereon as outer cylindrical bearing surface having a diameter which approximates the diameter of said first opening; and

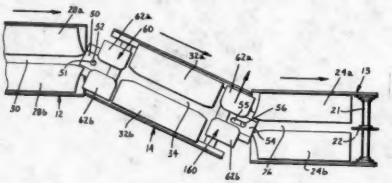
a pair of platelike, planar wings fixed to said top wall in substantially coplanar relationship therewith and projecting outwardly from opposite sides thereof beyond the respective sidewall, and said small opening being positioned below said wings.

4,618,057

CHAIN-LINK BELT CONVEYOR WITH ADJUSTABLE PARALLEL OFFSET AND VARIABLE RADIUS GUIDE

M. Gene Howser, Cartersville, Ga., assignor to Production Systems, Inc., Marietta, Ga.

Filed Oct. 24, 1984, Ser. No. 664,228
Int. Cl.[4] B65G *21/10*
U.S. Cl. 198—861.2 **7 Claims**



1. An articulated conveyor comprising:

a continuous loop belt;

a fixed first frame section and a second frame section operatively associated with said belt;

carrier means for supporting and moving only said second frame section for horizontal linear translational movement relative to said fixed first frame section, wherein said second frame section is mounted upon and supported by said carrier means for horizontal linear translational movement in a direction substantially perpendicular to the longitudinal axis of said second frame section, and wherein said carrier means is selectively operative to linearly translate said second frame section relative to said fixed first frame section in a direction substantially perpendicular to the longitudinal axis of said fixed first frame section such that said first and second frame sections are maintained substantially in parallel relation during said linear translational movement;

a third frame section joining said first and second frame sections, one end of said third frame section being pivotably mounted to one of said first or second frame sections, and the other end of said third frame section being pivotably and slidably mounted to the other of said first or second frame sections; and

means associated with said first, second, and third frame sections for guiding said continuous loop belt for travel over said frame sections;

wherein said continuous loop belt is constrained by said guide means for travel across the top of said first, second, and third frame sections and for return underneath said first, second, and third frame sections; and

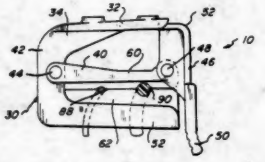
whereby said second frame section can be linearly translationally moved upon said carrier means to provide for parallel offset of said second frame section with respect to said fixed first frame section, said first and second frame sections being maintained in substantially parallel relationship during said horizontal linear translational movement.

4,618,058

LOCKING TROLLEY FOR GARMENT BAG

James S. Gregg, and Lawrence R. Mobley, both of Aurora, Colo., assignors to Samsonite Corporation, Denver, Colo.

Filed Nov. 23, 1984, Ser. No. 673,353
Int. Cl.[4] B65D *85/18*
U.S. Cl. 206—291 **26 Claims**



1. A locking trolley for suspending and retaining hooked ends of clothes hangers within the interior of a garment bag, comprising:

a substantially rigid frame member of generally C-shaped configuration having an upper horizontal portion, a back vertical portion extending downward from the rear of the upper horizontal portion, and a lower horizontal portion extending forward from the lower end of the back vertical portion, the upper and lower horizontal portions being vertically separated by a space open at the front of the C-shaped frame member and closed at the rear of the frame member by the back vertical portion;

a jaw member pivotably connected at a rear end thereof to the vertical portion of the frame member and extending forward through the space at a location between the upper and lower horizontal portions and terminating at a forward end thereof;

a gripping structure connected to the jaw member and facing the lower horizontal portion of the frame member;

a gripping structure connected to the lower horizontal portion of the frame member and facing the jaw member;

the gripping structures contacting and retaining the hooked ends of the hangers when in operative hanger-end gripping adjacency with one another upon a predetermined degree of pivoting movement of the jaw member toward the lower portion of the frame member;

the gripping structures separating to allow free movement of the hanger ends therebetween upon a predetermined degree of pivoting movement of the jaw member away from the lower portion of the frame member; and

a lever pivotably connected to the forward end of the jaw member, the lever having a lower end and an upper end extending in respectively opposite directions from the location at which the lever is pivotably connected to the jaw member, the lever pivoting between a first position in which its upper end extends into the space between the jaw member and the upper portion of the frame member and its lower end extends forward of the front end of the jaw member and a second position in which the lever generally extends across the space at the front of the C-shaped member, the upper end of the locking lever including means operatively contacting and moving along the upper portiOn of the frame member for pivoting the jaw member about its rear end into a generally aligned relation with the lower horizontal portion of the frame member in which the gripping structure on the jaw member is in hanger-end gripping adjacency with the gripping structure of the lower portion of the frame member as the lever is moved into the second position.

18. A locking trolley adapted to be operatively connected to the interior surface of a top side gusset of a garment bag, and operative for suspending the hooked ends of clothes hangers within the interior of a garment bag on a non-inclined gripping structure when the trolley is in an unlocked condition, and operative for retaining the hooked ends of hangers on the gripping structure when the trolley is in a locked condition, comprising:

a substantially rigid frame member of generally C-shaped configuration having an upper horizontal portion, a back vertical portion extending downward from the rear of the upper horizontal portion, and a lower horizontal portion extending forward from the lower end of the back vertical portion, the upper and lower horizontal portions being vertically separated by a space open at the front end of the C-shaped frame member and closed at the rear end of the C-shaped frame member by the back vertical portion;

means for connecting the frame member to the garment bag with the upper portion of the frame member positioned facing the top side gusset and the lower portion positioned below the upper portion;

a jaw member extending generally forward through the space defined by the C-shaped frame member;

a gripping structure connected to the lower portion of the frame member and facing the jaw member, the gripping structure extending in a generally non-inclined and horizontal manner to contact and suspend the hooked ends of the hangers when the trolley is in the unlocked condition and to contact and retain the hooked ends of the hangers when the trolley is in the locked condition;

means connecting the jaw member to the frame member and operative for moving the jaw member toward the lower horizontal portion of the frame member to position the hanger ends in gripping adjacency and retention with the gripping structure when the trolley is in the locked condition, and operative for moving the jaw member away from the lower horizontal portion of the frame member to release the hanger ends for free suspension on the gripping structure and to provide an access opening in the space between the gripping structure and the jaw member when the trolley is in the unlocked condition; and

selectively operable locking and unlocking means operatively connected between the jaw member and the frame member for maintaining the jaw member positioned toward the lower portion of the frame member to maintain the locked condition of the trolley and for releasing the jaw member for movement away from the gripping structure to achieve the unlocked condition of the trolley.

4,618,059

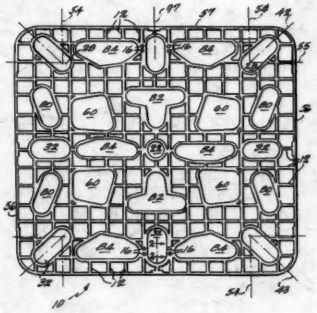
DIVIDER FOR SEPARATING STACKED ARTICLES

James A. Cochran, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Mar. 17, 1983, Ser. No. 476,381

Int. Cl.[4] **B65D** *85/676, 85/04, 21/02*

U.S. Cl. 206—392 **13 Claims**



1. A divider for separating stacked articles of the type having a support member with filamentary material wrapped on said support member defining a body thereof having opposite ends, said support member having opposite ends and said ends of said body of material being spaced respectively inwardly of said ends of said support member with said divider accommodating various predetermined diameters of said bodies, said divider comprising a substantially rigid planar member defining opposing pairs of exterior edges and including:

means defining an opening substantially centrally disposed in said member;

means defining a first grouping of first elongated apertures having opposing arcuate end surfaces, each of said first apertures being disposed near a respective corner of said member and inwardly angularly oriented towards said opening; and

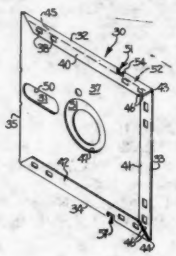
means defining a second grouping of second elongated apertures having opposing arcuate end surfaces, each of said second apertures being disposed in said member substantially midway between respective pairs of said first apertures, the axis of elongation of said second apertures being in substantial alignment with one of the mutually perpendicular bisecting axes of said member;

said apertures extending completely through said rigid planar member so that, when a set of said support members having each a body having a selected diameter is loaded on said rigid member with the respective ends thereof inserted into selected said apertures, adjacent ones of said support members may be moved generally parallel to said planar rigid member to permit a maximum number of said support members to be loaded thereon, said maximum number being dependent on the diameters of said bodies.

4,618,060
FLOPPY DISC CASING WITH OPTIONAL WRITE-PROTECT CAPABILITY

Norman D. Tarter, Rte. 4, Box 456, Woodville, Miss. 39669

Filed Nov. 7, 1985, Ser. No. 796,080
Int. Cl.[4] G11B *23/02*; B65D *85/57*
U.S. Cl. 206—444 14 Claims



1. A protective casing for holding a magnetic recording disc for a computer disc drive, and which is characterized by a write-to-disc function and an optional read-only/write-protect capability, said casing comprising,

a thin, substantially flat envelope of rectangular outline and having four side edges, said envelope comprising front and back sheets and including a slot which extends along at least one of said side edges;

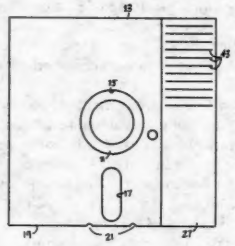
a notch formed in said one side edge of said envelope and communicating with said slot, with said notch defining opposite sides and a bottom side; and

a generally flat write-protect strip slideably positioned within said slot and having a lip extending outwardly perpendicularly from said strip within said notch for facilitating retention of said strip in said slot and sliding movement of said strip between respective write-to-disc and write-protect positions, with at least one of said positions being defined by placing said lip against a side of said notch.

4,618,061
DEVICE FOR PROTECTION OF DIGITAL DATA

Viktor P. Rubenfeld, Manhattan Beach, Calif., assignor to SEQUENCE, Santa Monica, Calif.

Filed Oct. 12, 1984, Ser. No. 660,115
Int. Cl.[4] B65D *85/30*
U.S. Cl. 206—444 10 Claims

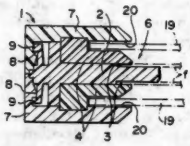


1. In a combination for preventing alteration of electronic data stored on a floppy disk, said combination including a generally rectangular envelope containing said floppy disk and covering a substantial portion of the surface thereof, said envelope being provided with an opening traversable by a mechanical switch element in an electronic apparatus upon an insertion thereinto of said envelope and said floppy disk, said combination further including data protection means engageable with said envelope for covering said opening and preventing the traversal thereof by said mechanical switch element upon an insertion of said envelope and said floppy disk into said electronic apparatus, whereby said electronic apparatus is disabled from altering information electronically stored on said floppy disk, the improvement wherein the data protection means comprises an additional envelope into which the generally rectangular envelope with the floppy disk may be slidably inserted, said additional envelope having sufficiently large dimensions to cover the opening in said generally rectangular envelope upon the insertion thereof into said additional envelope, said additional envelope being removably securable to said generally rectangular envelope by a friction fit.

4,618,062
FILM HOLDER FOR CAMERAS

Kanji Tomidokoro, Tokyo, Japan, assignor to Komamura Photographic Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1985, Ser. No. 784,470
Claims priority, application Japan, Oct. 4, 1984, 59-150289[U]
Int. Cl.[4] B65D *85/67*
U.S. Cl. 206—455 1 Claim

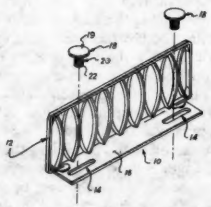


1. A plastic film holder for camera including a inner frame defining a photo-sensitive plate insert slot between a partition plate, and outer frames each defining a dark slide insert groove between said inner frame, wherein a plurality of stopper springs are formed on the peripheral sides of a body comprised of said partition plate and said inner frame, and a plurality of hooks are formed on each said outer frames overlaid on said body to define the dark slide insert slot, said stopper springs and hooks being in the corresponding realtionship, respectivly, so that they are engaged with each other to lock said body and outer frames together in an overlaid relationship.

4,618,063
ADJUSTABLE SHELF PARTITION

Walter M. Mendenhall, 512 Lillian Dr., Madeira Beach, Fla. 33738

Filed Sep. 19, 1983, Ser. No. 533,805
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—184 6 Claims



1. A shelf partition for use with a shelf having parallel rows of perforations, each row of perforations including a plurality

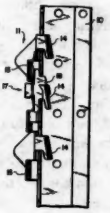
of perforations which are spaced apart by a predetermined distance, said shelf partition being positionable on said shelf for dividing said shelf into a pair of compartments; said shelf partition comprising an integral patition member consisting essentially of a base having a bottom surface adapted to rest on the shelf, a wall portion extending upward from said base, and a pair of longitudinally extending slots in said base; the length of each of said longitudinally extending slots in said base being greater than the spacing between adjacent rows of perforations in said shelf and being greater than the spacing between adjacent perforations in each of said rows, respective fastening means movable longitudinally in each of said slots and being adapted to couple the base to a perforation at any point along the longitudinal length of its respective slot, thereby allowing adjustment of the orientation of the partition relative to shelf and adjustment of the position at which the fastening means couples the partition to a perforation.

4,618,064

DEVICE FOR LOCKING A BEAM TO AN UPRIGHT, FOR EXAMPLE IN A PALLET RACK

Ake E. Viklund, Säffle, Sweden, assignor to Electrolux Constructor Aktiebolag, Saffle, Sweden

Filed Apr. 2, 1984, Ser. No. 595,602
Claims priority, application Sweden, Apr. 15, 1983, 8302115
Int. Cl.⁴ A47F *5/00*
U.S. Cl. 211—192 **7 Claims**



1. A device for locking a beam to an upright having spaced holes therein such as in a pallet rack, said beam being provided with at least one hook adapted to be inserted through any of said holes in the upright, and a spring-biased lock device having locking means which in a locking position is inserted in the free space above the hook in said hole, said lock device being provided with a member by which it can be moved manually against the action of a spring to an extracted position, so that a first surface of the lock device, at least initially during a lifting movement performed when the beam is to be removed, is in engagement with said upright thereby retaining the device in the extracted position, said first surface being so constructed to disengage from said upright during continued lifting movement of the beam whereby said lock device under the action of said spring snaps into a prestressed position from which it by means of the upright is moved to said locking position when the beam is fastened to said upright.

4,618,065

SANITARY WASH BOTTLE KIT TWO PART CLOSURE

Durward O. Guth, 551 Granville Ave., Hillside, Ill. 60162

Filed Sep. 19, 1985, Ser. No. 777,589
Int. Cl.⁴ B65D *39/16*
U.S. Cl. 215—3 **3 Claims**

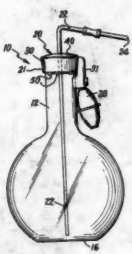
1. In a two-part stopper forming a wash bottle kit assembly adapted to introduce tubing extending to the bottom of the flask in which a pressurized liquid passes up the tubing within the flask and out of the outlet to the stopper outside of the flask;

an apertured outer stopper fitted with a counterbore, an inner groove for the lip of the flaks and with a depending leg lying below the top of the stopper and along the neck of the flask contoured to fit against the neck below the lip of the flask, the depending leg having a vertical passageway connected at one end to a pump and at the other end of the leg to a horizontal passageway into the flask;

and an inner stopper formed with a projecting flange fitting within the conterbore of the outer stopper and forming a common top surface, said inner stopper further having a central axial bore for receiving bent tubing extending through to the bottom of the flask to dispense liquid, that improvement comprising:

said inner stopper formed of a soft resilient elastomer material in which the top portion of the inner stopper is formed with a stepped outer flange extending into a recessed portion of the counterbore of the apertured outer stopper;

said inner stopper being further formed at its bottom portion with downwardly projecting lobes equally spaced around



the circular cross-section to provide at least five and not more than six soft yieldable compressible contact surfaces against the inner side walls of the flask and below the lip thereof;

said multiple lobes providing interlobar spaces for the free passage of pressurized air from the bulb through the dependent leg across the horizontal passageway and in the space between the inner stopper and the outer stopper and said inner stopper being provided with an axial bore having a diameter at the top and bottom of said stopper which is slightly larger than the diameter of the bent tubing introduced through said bore, said axial bore being widened below the top portion and above the bottom portion to be slightly wider in this middle portion thereby facilitating manipulation of the glass tubing while it is being pushed through the bore.

4,618,066

COMBINED INSULATED DRINKING MUG AND MEGAPHONE

John G. Vail, Oakland, Calif., assignor to Mug-A-Phone, Inc., Daytona Beach, Fla.

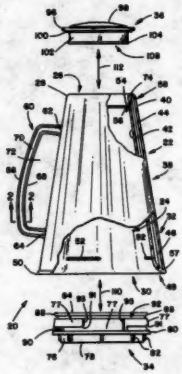
Filed Aug. 20, 1984, Ser. No. 642,585
Int. Cl.⁴ A47J *41/00*
U.S. Cl. 215—12 R **2 Claims**

1. An apparatus for use as a liquid container in a closed mode and as a megaphone in an open mode, the apparatus comprising:

(a) a rigid, hollow, frusto-conical body formed by a pair of continuous walls joined together in spaced-apart relation to define therebetween a frusto-conical, annular resonating chamber and thermal insulating space extending over substantially the entire height of the body, the walls terminating in and defining an outlet opening at a bottom, large diameter end of the body and an open port at the top, small diameter end of the body, the walls being integrally joined together proximate the port by a circumferentially extending joint positioned in axially spaced relationship to the small diameter end with one of the walls extending between the inside and the outside of the body to provide

a smooth, continuous wall portion at the port for engagement by the mouth of the user, and the walls being joined together proximate the outlet opening by a circumferentially extending joint maintaining the walls in spaced relationship substantially over the height of the body;

(b) sealing means formed for selective repeated mounting to and removal from the body in a position sealing the outlet, the sealing means being provided as an end closure mounted to the body by a bayonet coupling structure including mating cooperating sets of bayonet elements with one set of bayonet elements provided on the inside



wall of the body proximate and axially inwardly of the outlet and of the body, and mating set of bayonet elements provided on the end closure, the bayonet structure locking the end closure to the body to render the body useful in a closed mode as a liquid container and releasing the end closure for removal from the body to open the body for use in an open mode as a megaphone and

a cap formed for selective repeated mounting to and removal from the body in a position closing the port, the cap and the port being matingly dimensioned to frictionally retain the cap mounted in the port.

4,618,067

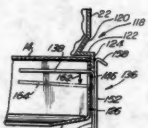
SURGICAL CASE CART

Robert J. Cohn, Dallas, Pa.; Frank C. Olsson, East Lyme, Conn.; James W. Holzman, New Tripoli, and Paul Santarelli, Hudson, both of Pa., assignors to Metropolitan Wire Corporation, Wilkes-Barre, Pa.

Division of Ser. No. 354,762, Mar. 4, 1982, Pat. No. 4,550,956. This application Feb. 11, 1985, Ser. No. 700,122

Int. Cl.[4] B65D *6/34;* **E06B** *3/70, 7/00*

U.S. Cl. 220—1.5 **4 Claims**



1. A cart comprising:

an enclosed container having a top, a bottom and sides to provide an interior space within said container, and at least one door panel provided at least at a front portion of said container, said door panel being movable between open and closed positions;

said door panel having a single pan construction, and stiffening wires provided internally of said door panel for increased rigidity of said door panel;

said door panel comprising a planar sheet portion having a top, a bottom, and opposing sides, said bottom of said planar sheet portion above the bottom of the door panel, said bottom of said door panel being disposed adjacent to said container bottom when said door panel is in the closed position;

a U-shaped channel being provided about said top and opposing sides of said planar sheet portion, said channel including a flange section connected to said top and opposing sides of said planar sheet portion, said flange section being directed toward said interior space when said door panel is in the closed position, and a depending lip connected to said flange section, said depending lip being directed toward a central portion of said door panel;

each end of said wires being secured to said door panel within said channel;

stiffening means disposed along said bottom of said door panel for providing additional rigidity to said door panel, said stiffening means including a substantially V-shaped bend directed toward said interior space when said door panel is in the closed position, said V-shaped bend being integrally disposed along said bottom of said planar sheet portion in a one piece construction;

said V-shaped bend including a first bent section having an end portion unitarily connected to said bottom of said planar sheet portion and extending away from said bottom of said planar sheet portion in an inclined direction toward said interior space when said door panel is in the closed position, and a second bent section having an end portion unitarily connected to the other opposing end portion of said first bent section and extending away from said opposing portion of said first bent section in a direction away from said interior space and substantially parallel to said container bottom when said door panel is in the closed position, said second bent section overlying the container interior bottom surface in the closed position of said door panel; and

baffle means for preventing air flow into said container, said baffle means including a lip integrally connected to an opposing portion of said second bent section in a one piece construction and extending away from said opposing end portion of said second bent section in a substantially vertical direction away from and substantially parallel to said planar sheet portion, said lip of said baffle means overhanging an outer surface of said container bottom along said front surface in said closed position of said door panel.

4,618,068

METHOD AND APPARATUS FOR SHIPPING AND STORING CARGO

Raymond W. Born, 4211 W. First St., Space 121, Santa Ana, Calif. 92703

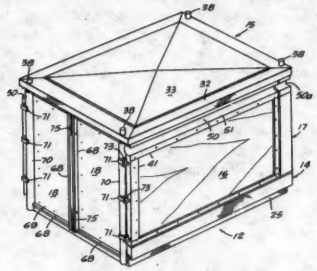
Filed Sep. 17, 1985, Ser. No. 777,012

Int. Cl.[4] B65D *7/24*

U.S. Cl. 220—4 R **45 Claims**

30. A cargo container comprising a four sided box having a top and a bottom and an opening across one end thereof; a pair of circular tubes extending along the opposite sides of said opening, a pair of doors for said opening hingedly supported for pivotal movement between a closed position generally inwardly of a plane common to the axes of said tubes and including pairs of hinge leaves one portion of which embraces a major exterior portion an adjacent one of said tubes and is fixed to said door panel and the other portion of which is fixed

to said container on the opposite side of said tubes, said pairs of hinge leaves being separably interconnected by a hinge pin



fixed to one of said hinge leaves; and means for locking said door panels closed.

4,618,069

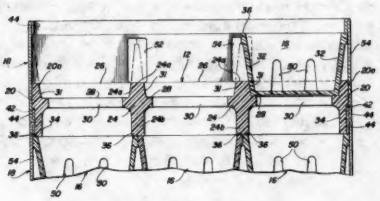
SHIPPING-AND-STORAGE CONTAINER

Paul Quong, 1914 Orangewood Ave., No. 102, Orange, Calif. 92668

Continuation-in-part of Ser. No. 591,854, Mar. 21, 1984, abandoned. This application Sep. 14, 1984, Ser. No. 650,272

Int. Cl.[4] B65D *21/02, 1/36, 69/00, 25/04*

U.S. Cl. 220—23.4 **42 Claims**



1. A container in combination with removable baskets for shipping and storing fresh produce, wherein said combination comprises:

a basket-support tray having a substantially rectangular configuration;

a plurality of baskets adapted to receive said produce for shipping, storage, and display therein, and to be carried by said basket-support tray;

a plurality of open-ended receptacles having upper and lower open ends formed in said basket-support tray, said baskets being removably mounted in said open-ended receptacles;

a peripheral frame member mounted about the outer surface of said basket-support tray; and

means formed between said peripheral frame member and said basket-support tray for interlocking a multiplicity of containers in a stacked arrangement to prevent separation thereof during shipping and storage;

wherein said basket-support tray comprises:

an outer peripheral wall structure defined by four side wall members;

a plurality of integrally formed, longitudinally and transversely disposed, inner wall members;

all of said wall members defining said open-ended receptacles to receive and support said baskets therein, whereby the structural load of each superposed container is transferred through each of said wall members when said containers are stacked for shipping or storage.

4,618,070

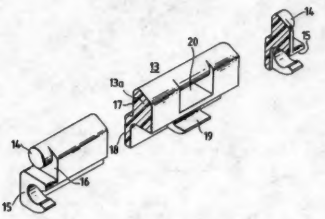
INJECTION MOULDED SHUTTER

Ralph E. Huckle, Chichester, England, assignor to De La Rue Systems Limited, Portsmouth, England

Filed Sep. 27, 1984, Ser. No. 655,505

Int. Cl.[4] B65D *43/14;* **E06B** *9/14*

U.S. Cl. 220—350 **6 Claims**



1. A flexible shutter comprising a series of interconnected injection moulded plastic strips, each strip having at each end integral male and female connecting members, and are formed so as to permit joining the strips in series to form the shutter, said integral male connecting members comprising a cylindrical projection extending longitudinally from each end of said strip, and each of said integral female connecting members being positioned below each of said integral male connecting members and comprising a C-shape element that projects laterally of said strip so as to receive the cylindrical projection of the male connecting member of an adjacent strip, each strip also having along its entire length a recess portion and a corresponding overlapping portion positioned adjacent said recess portion, each recess portion being offset from the adjacent overlapping portion of said adjacent strip, whereby the corresponding overlapping portion of one strip is designed to be received within the recess portion of an adjacent strip, and each of said strips including intermediate its ends a tongue and groove positioned so that when the strips are joined in series with their respective ends substantially aligned to form the shutter, said tongue of one strip enters the groove of an adjacent strip so as to interlock the strips to prevent tampering and to allow flexibility of the strips, said tongue of each of said strips extending laterally of the strip in the same direction as said C-shape element projects and being positioned on said strip on an extension, said extension being the length of the strip and extending from said overlapping portion offset therefrom in substantially the same plane as the recess to thereby define said recess with said overlapping portion, being positioned on said corresponding overlapping portion aligned with the corresponding tongue on said strip and the adjacent strip.

4,618,071

VENTING DEVICE FOR AN ELECTRONICS HOUSING

Jacques Vincent, Cahors, France, assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 14, 1985, Ser. No. 798,203

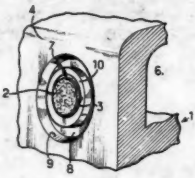
Claims priority, application France, Nov. 29, 1984, 84 18163

Int. Cl.[4] B65D *51/16*

U.S. Cl. 220—371 **8 Claims**

1. Venting device for an electronics housing, including a passage provided through a wall of the housing, said passage

connecting the inside and the outside of the housing and a filter fitted into the said passage, and a peripheral liquid channeling



groove provided in the outside surface of said wall and completely surrounding the opening of the said passage.

4,618,072

BILL PAYING MACHINE

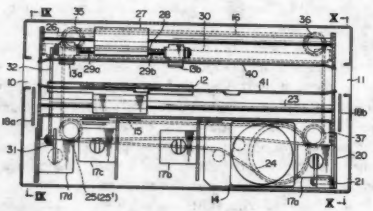
Eiichi Yoshikawa, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,229

Claims priority, application Japan, Aug. 30, 1983, 58-158504; Aug. 31, 1983, 58-159970

Int. Cl.⁴ G07F *11/00, 11/16;* B65H *5/22;* B65G *57/00*

U.S. Cl. 221—2 **8 Claims**



1. A bill-paying machine adapted to be positioned between two operator positions situated on the right- and left-hand sides and used in common by two operators, comprising: two paying outlets arranged opposite each other at the right- and left-hand sides on the front portion of a housing constituting the external surface of said bill-paying machine, and having an opening in each of the right and left sides opposed to each other; a transport device for transporting a predetermined number of bills sent out from bill containers inside said housing on the basis of an instruction for payment issued by each operator; and a distributing device for receiving the bills transported by said transport device and moving the same in the right- and left-hand directions to the respective outlet, thereby to pay out the bills through one of said paying outlets, wherein said distributing device includes a receiving plate where bills sent out by said transport device are placed in face to face relationship in a horizontal plane, said receiving plate movable transversely between said paying outlets, holding means cooperable with said receiving plate for releasably holding bills on said receiving plate and movable therewith between said paying outlets, and release means for releasing said holding means.

4,618,073

CUP DISPENSING APPARATUS

William Bartfield, 15150 Dickens St., #304, Sherman Oaks, Calif. 91403, and Charles L. Ferguson, 779, Manchester, N.H. 03105

Filed Apr. 29, 1985, Ser. No. 728,523

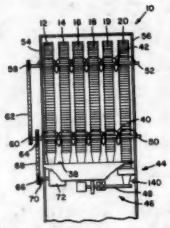
Int. Cl.⁴ G07F *11/12*

U.S. Cl. 221—11 **11 Claims**

1. A cup dispenser for containing and individually releasing cups for dispensing a product from a vending machine, said dispenser comprising:

a. housing means for housing a plurality of cups provided in nested relationship in plural tubular stacks, each of said cups having a base and including an outwardly extending rim at its upper edge, one of said stacks being a dispensing stack positioned at a dispensing column having a dispensing column opening, and the remaining stacks being supply stacks;

b. dispensing means for supporting said dispensing stack and for sequentially separating single cups from the bottom of said dispensing stack to permit each of the separated cups to drop from the dispensing means;



c. advancing means for selectively advancing at least one of said supply stacks to the dispensing column when the initial dispensing stack is exhausted; and

d. support means selectively interposable below said dispensing opening for receiving and supporting each said supply stack after it has been advanced to the dispensing column and the lowermost cups have fallen partially through said dispensing column opening, said support means operative to support the lowermost cup of the dispensing stack at its base so that its outwardly extending rim is above said dispensing means, whereby the impact of the falling dispensing stack as it falls into the dispensing column opening is borne by the base of the lowermost cup to thereby avoid damage to the rim of that cup.

4,618,074

COIN-OPERABLE MACHINE FOR DISPENSING COOLING ELEMENTS

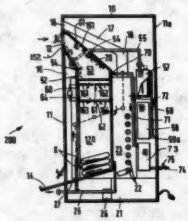
György Teglasy, Masenkamp 62, 2000 Hamburg 62, and Ludwig Galambos, Lawaetzweg 7, 2000 Hamburg, both of Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,647

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1983, 8330770[U]; Jul. 27, 1984, 8422376[U]

Int. Cl.⁴ G07F *7/06, 9/10*

U.S. Cl. 221—15 **18 Claims**



1. A coin-operable machine for dispensing cooling elements, particularly for the use thereof in cooler bags and cooler boxes for keeping food fresh, and for keeping drinks cool, comprising in combination

a box-shaped casing, including

a refrigerating compartment for cooling a cooling element passing therethrough,

a front panel formed in an upper region thereof with an insertion slot adapted to receive a cooling element,

a guideway having a major portion thereof in an upright position, said major portion passing through said refrigerating compartment, the remaining portion of said guideway including a cooling element cleaning chamber,

inlet and discharge means for passing and discharging hot water or steam into and from said cooling element cleaning chamber, respectively, and openable guideway closing means for said major portion of said guideway, said remaining portion being separated from the major portion of said guideway by said guideway closing means and,

wherein said cleaning chamber has a cooling element discharge side,

said guideway closing means comprising a base plate for selectively opening and closing a bottom opening of said cleaning chamber formed near said cooling element discharge side, and

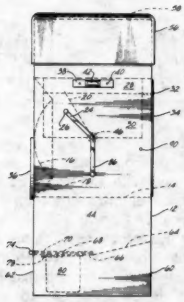
coin-controlled cooling-element retaining and delivery means formed with a cooling element removal slot communicating with a lower end of said major portion of said guideway, said retaining and delivery means being adapted to further cool and maintain the cooling element at a predetermined temperature, pending removal therefrom.

4,618,075

COMBINED STORAGE CONTAINER, SIFTER AND DISPENSER FOR FLOUR

Ernestine Hampton, 400 Mt. Washington, Los Angeles, Calif. 90065

Filed Feb. 9, 1984, Ser. No. 578,420
Int. Cl.[4] B67D *5/58*
U.S. Cl. 222—189 **9 Claims**



1. An apparatus for storing, sifting and dispensing of flour comprising:

a flour storage container providing at opposed container ends thereof a first flour inlet and a first flour outlet;

means for sifting flour contained by the storage container and disposed between the first flour inlet and first flour outlet and providing at least a second flour inlet separate from the first flour inlet and a sifted flour outlet separate from said first flour outlet and opposed the second flour inlet; and

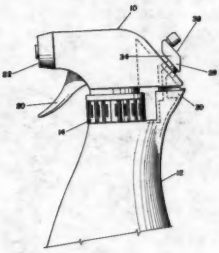
support means for said storage container, said support means rotatably supporting the storage container to enable, by rotation of said storage container, independent dispensing of flour from said first flour outlet or said sifted flour outlet by positioning said storage container for flour at a position where gravity will aid the discharge of flour through the first flour outlet or sifted flour through the sifted flour outlet.

4,618,076

DUAL DISPENSING BOTTLE

Scott A. Silvenis, Mauldin, S.C., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 20, 1983, Ser. No. 515,714
Int. Cl.[4] B05B *9/043*; B65D *17/28*
U.S. Cl. 222—331 **8 Claims**



1. A container comprising

a hollow body having a first upwardly extending neck and a second upwardly extending neck, said first upwardly extending neck being provided with coupling means for, and said container being adapted for, the connection thereto of a finger actuated pump and associated spray nozzle having mating coupling means,

a frangible twist-off closure for sealing said second upwardly extending neck and having an elongated body, said twist-off closure being formed as an integral part of the hollow body and continuous with said second neck, and joined to said second neck by a reduced thickness joining portion to facilitate separation thereof from said second neck by twisting, said twist-off closure further having a reclosure portion formed thereon, said reclosure portion being adapted to be pressed into the opening that is formed in said second upwardly extending neck by removal of said twist-off closure, and sized for reclosing the opening, when said twist-off closure has been twisted off said second upwardly extending neck, and means including the extent of elongation of said elongated body and the position of said frangible closure on said elongated body for providing leverage in twisting said frangible closure to effect rupture thereof; wherein said elongated body has a first side and a second side, said first side and said second side being disposed in opposing relation with respect to said elongated body, with said first side including a frangible seal for said second upwardly extending neck, and with said second side having said reclosure portion formed thereon; and wherein said frangible seal is positioned on said first side adjacent one end of said elongated body and said reclosure portion is positioned on said second side adjacent the other end of said elongated body whereby there is provided said leverage in twisting said twist-off closure of said second upwardly extending neck and in twisting said reclosure portion to facilitate the pressing thereof into the opening in the second upwardly extending neck.

4,618,077

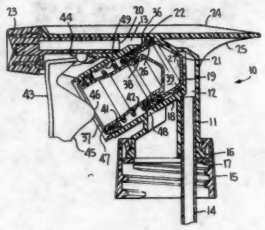
LIQUID DISPENSING PUMP

Douglas F. Corsette, 6559 Firebrand St., Los Angeles, Calif. 90045

Filed Mar. 7, 1984, Ser. No. 587,070
Int. Cl.[4] B67D *5/40*
U.S. Cl. 222—383 **27 Claims**

16. A liquid dispensing pump, comprising a pump body, a separate closure cap engaged with said pump body for mounting said pump body on a container of flowable product to be dispensed, said pump body including outwardly opening cylin-

der means having a bore of predetermined diameter and a counterbore of relative greater diameter, said cylinder means being disposed at an angle to the central axis of said closure cap, a pump piston reciprocable in said cylinder means, said piston having piston seal means in sliding sealing engagement with the wall of said bore and defining together therewith a variable volume pump chamber, said pump body having inlet and outlet means for delivering product into and out of said pump chamber, means for manually reciprocating said piston, said cylinder means including a vent port establishing commu-



nication between the interior of said counterbore and the interior of the container, said piston having an annular seal means in sliding sealing engagement with the wall of said counterbore for sealing off said vent port from the atmosphere in a non-pumping position, and means at said wall of said counterbore for disengaging said annular seal means from said wall of said counterbore to thereby establish in a pumping position a vent passage for venting the container through said vent port, said annular seal means being located outwardly of said disengaging means in said non-pumping position.

4,618,078

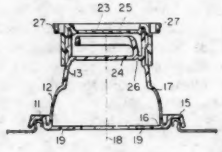
VENTED NESTABLE POURING SPOUT

Martin E. Hamman, and Gary M. Baughman, both of Auburn, Ind., assignors to Rieke Corporation, Auburn, Ind.

Continuation-in-part of Ser. No. 610,688, May 16, 1984, Pat. No. 4,555,048. This application Aug. 22, 1984, Ser. No. 643,070

Int. Cl.[4] B67D *3/00*

U.S. Cl. 222—478 **17 Claims**



1. A pouring spout for use with a container, comprising:

a spout having means for alternately disposing said spout in a nested orientation or in an extended pouring orientation;

means for securing said pouring spout to said container; and

a plurality of ears moveably attached with respect to said spout, said ears extending inwardly within said spout and cooperating to define a central flow aperture for the outflow of liquid and a plurality of peripheral vent openings for the inflow of air, when, and only when, said spout is disposed in the extended pouring orientation.

4,618,079

REFRACTORY, HEAT-INSULATING SLABS

Andrew Barnes, Birmingham; Gary K. Elliott, Stourbridge; William MacFarlane, Birmingham, all of England, and Stephen T. Pheasant, Makati, Philippines, assignors to Foseco Trading A.G., Chur, Switzerland

Filed Nov. 8, 1983, Ser. No. 549,811

Claims priority, application United Kingdom, Dec. 1, 1982, 8234319

Int. Cl.[4] C04B *35/04*

U.S. Cl. 222—591 **20 Claims**

1. A refractory, heat-insulating slab for use in the inner, expendable lining of a tundish comprising a slurry-formed facing (to face the molten metal in the tundish), comprising magnesium oxide having a hydration value of 1.7 or less, inorganic binder but substantially no organic matter, the said facing having a combined water content not exceeding 2% by weight at ambient temperature and a different backing comprising refractory filler and binder, the said backing having a permeability value of at least 10 AFS units, the facing and the backing having been joined together during formation of the facing or the backing.

4,618,080

GARMENT HANGER

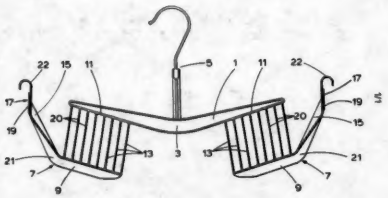
Peter Shalson, Radlett, United Kingdom, assignor to Braitrim (London) Limited, London, United Kingdom

Filed Oct. 17, 1984, Ser. No. 661,694

Claims priority, application United Kingdom, Oct. 17, 1983, 8327739

Int. Cl.[4] A47G *25/30*

U.S. Cl. 223—95 **13 Claims**



1. A garment hanger comprising an elongate bar, a hook member interconnected with and arranged generally perpendicular to the bar, a pair of limbs with each limb located in the region of a respective end portion of the bar and being remotely spaced from the respective end portion by at least two elongate parallel links connected between each limb and the respective end portion of the bar such that each limb is separately movable in a direction parallel to the respective end portion of the bar, the at least two parallel links of each limb being hingedly secured to both said limb and respective end portion and being resilient to permit limited movement of the limbs towards each other, and garment gripping means located on each limb at the outermost end thereof to prevent slipping of a garment hung on the hanger.

4,618,081

APPARATUS FOR MOUNTING FLASHLIGHTS TO BICYCLES

Mallory F. Miree, 3512 Springhill Rd., Birmingham, Ala. 35223

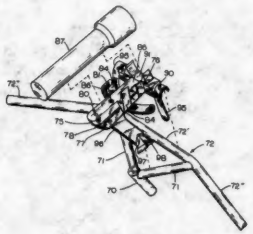
Continuation-in-part of Ser. No. 559,098, Dec. 7, 1983, Pat. No. 4,541,555. This application Sep. 13, 1985, Ser. No. 775,797

Int. Cl.[4] F21V *33/00*

U.S. Cl. 224—41 **12 Claims**

1. A mount for mounting a flashlight to a bicycle of the type having a handlebar from which a pair of struts extend, and with the mount comprising a cradle having a concave upper surface in which a flashlight may be cradled, a forward cross-

arm extending laterally from a forward end of said cradle and which has a bottom surface shaped to be mated against the handlebar, a stanchion extending downwardly from a rear end of said cradle, a rear crossarm extending laterally from a lower



end of said stanchion and which has ends shaped to be mated against the bicycle struts, and binding means for binding said forward crossbar to the handlebar and a flashlight to said cradle.

4,618,082

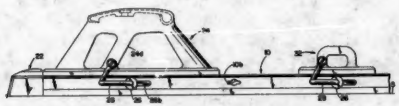
LUGGAGE RACK

James C. Bell, Stratford, Conn., assignor to Oliver Industries, Inc., Orange, Conn.

Filed May 24, 1985, Ser. No. 738,085

Int. Cl.[4] B60P *9/04*

U.S. Cl. 224—321 **20 Claims**



1. A luggage rack for a vehicle surface comprising at least two upwardly open channel shaped slats adapted for attachment to such a surface in spaced parallel relationship to one another, each slat having a base and parallel side walls spaced laterally to define on elongaged channel of width (W), longitudinally extending inturned lips integrally connected to said side walls such that said lips define a top opening for the channel of smaller lateral dimension than the interior width (W) of the slat channel, stanchions slidably mounted in said slat channels, each stanchion having a base with a lower portion slidably received inside said channel and having grooves to receive said inturned lips, non-threaded fasteners for said stanchions, each stanchion fastener including a pin adapted for insertion axially into aligned openings in said channel side walls and in said stanchion base lower portion, and means carried by said stanchion fastener to selectively restrict said pin against axial movement out of said aligned openings to prevent slidable movement of said stanchion in its channel.

4,618,083

LADDER CLAMPING DEVICE FOR VEHICLE RACK

Kenneth F. Weger, Jr., Cary, Ill., assignor to Knaack Mfg. Co., Crystal Lake, Ill.

Continuation of Ser. No. 611,350, May 17, 1984, abandoned. This application Sep. 12, 1985, Ser. No. 775,505

Int. Cl.[4] B60R *9/00*

U.S. Cl. 224—324 **8 Claims**

1. A rack which supports a ladder and which is mountable to a vehicle, said vehicle rack comprising:

first and second pairs of first and second corner positions;

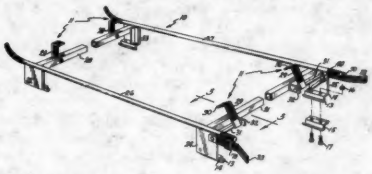
first and second transverse frame members extending bridgingly between the first and second corner positions of the first and second pairs of corner positions, respectively;

a first clamp mounted to the first frame member for engaging one rung of the ladder;

a rod rotatably mounted to at least one of the corner positions between which the second frame member extends, said rod extending from said one corner position parallel to the second frame member;

a second clamp mounted to the rod;

handle means rigidly connected to the rod for rotating the second clamp in a first direction into engagement with another rung of the ladder or in the opposite direction out of engagement with said another rung of the ladder;



a link proximate said one corner position and rigidly connected at a first linkage point to the rod and rotatable therewith; and

spring means pivotally mounted at a second linkage point to the link and at a third linkage point to said one corner position for biasing the link in the first rotational direction when the second linkage point lies on one side of a line between the first and third linkage points and for biasing the link in the opposite rotational direction when the second linkage point lies on the other side of the line between the first and third linkage points.

4,618,084

OPTICAL FIBRE CUTTING TOOL

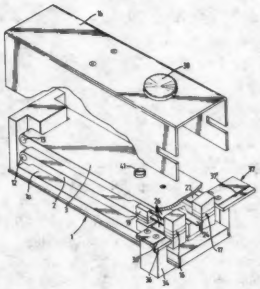
Patrick V. Andrews, Datchet, and Edward Z. Kaczmarski, London, both of England, assignors to BICC Public Limited Company, London, England

Filed Jun. 13, 1985, Ser. No. 744,386

Claims priority, application United Kingdom, Jun. 14, 1984, 8415167

Int. Cl.[4] C03B *37/16*

U.S. Cl. 225—96 **11 Claims**



1. A hand tool for providing an optical fibre with an end face that is substantially flat and lies in a plane radial to the axis of the fibre, which hand tool comprises four elongate members extending side by side; the first of which elongate members is of substantially tubular form and surrounds the other three elongate members and has, mounted on the member near one of its ends, one jaw of each of two pairs of jaws transversely

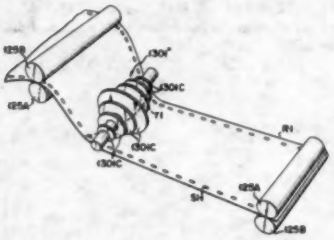
spaced on opposite sides of the longitudinal axis of the member and, between said jaws, a table having a curved surface whose axes of curvature lie on a rectilinear axis extending lengthwise of the member; the second of which elongate members is pivotally connected to the tubular first member at its end remote from the table about an axis extending transversely of the members, is urged away from an internal surface of the tubular first member by spring means and carries, near its other end, the other jaw of each of said transversely spaced pairs of jaws, the jaws of one pair of the pairs of jaws being so resiliently mounted on the first and second members that, when the jaws move towards one another to grip an optical fibre between them, the parts of the jaws in contact with the fibre will tend to move away from the table and from the other pair of jaws to exert a tensile force on the fibre; the third of which elongate members is pivotally connected to the tubular first member at its end remote from the table about an axis extending transversely of the members, is urged away from the second member by said spring means and carries near its other end an elongate cutter having a cutting edge which is substantially normal to tangents of the curved surface of the table; and the fourth of which elongate members is pivotally connected at one of its ends to the tubular first member about an axis extending transversely of the members and is so shaped intermediate of its ends that, when it is caused to pivot towards the third and second members, an intermediate part of said fourth member bears against the third member to cause the second and third members to pivot against the action of said spring means and so cause the jaws of the pairs of jaws to grip an optical fibre positioned therebetween and to cause the cutting edge to contact and move transversely across the tensioned optical fibre to score the fibre to such an extent that the fibre breaks to form end faces of the fibre that are substantially flat and lie in planes radial to the axis of the fibre.

4,618,085

SHEET SEPARATING APPARATUS

Tokuji Kimura, and Toshio Urushihara, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Jun. 29, 1984, Ser. No. 626,389
Claims priority, application Japan, Jun. 30, 1983, 58-119568
Int. Cl.[4] B65H *35/10*
U.S. Cl. 225—100 **1 Claim**



1. A sheet separating apparatus for separating a sheet, which is elongated in a longitudinal direction and includes a plurality of weakened lines each crossing the longitudinal direction of said sheet, into a plurality of relatively small pieces along said weakened lines, said apparatus comprising:

first tensioning means for applying tension to said sheet in said longitudinal direction thereof; and

second tensioning means for applying additional tension in said longitudinal direction which additional tension is non-uniform along successive weakened lines and which additional tension is applied while said sheet is being tensioned by said first tensioning means;

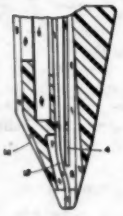
wherein said second tensioning means includes a roller located in a fixed position and having an axis extending across the width of said sheet, said roller including a plurality of disks space apart along said axis, said disks gradually decreasing in diameter from a central portion of said roller toward each end of said roller, the outer peripheries of said disks abutting against said sheet to apply non-uniform tension along the width of said sheet.

4,618,086

SKIN STAPLER

Lehmann K. Li, and Michael Marra, both of Fairfield, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 12, 1984, Ser. No. 588,415
Int. Cl.[4] A01B *17/00*
U.S. Cl. 227—19 **8 Claims**



1. In a surgical stapler having an anvil surface terminating in a flange, a staple feed track movably containing a plurality of staples and a staple forming track movably containing a forming blade, the improvement comprising the nondistal portion of said feed track being substantially parallel to said forming track and the distal portion of said feed track being in substantial alignment with the distal portion of said forming track

(A) in a point to crown configuration

(B) and the portion of said feed track between said distal and said nondistal portions being shaped

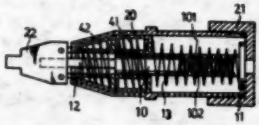
such that said plurality of staples in said feed track move continuously and uninterrupted to said anvil flange, the distal ends of said tracks being open in the same direction and the distal end of said feed track being between the anvil flange and the distal end of said forming track.

4,618,087

HIGH IMPACT FORCE STAPLING MACHINE WITH REBOUNDED IMPACT FORCE DAMPING

Wen T. Lai, No. 11, Ya Hsiu Rd., Ta Ya Hsiang, Taichung Hsien, Taiwan

Filed Jun. 12, 1985, Ser. No. 743,813
Int. Cl.[4] B25C *1/06, 5/15*
U.S. Cl. 227—131 **2 Claims**



1. An improved stapler with increased momentum for better hitting capability and better absorption of the rebound momentum comprising

a casing for the stapler;

a ram-driver combination mounted for reciprocal movement in said casing in a forward reciprocal movement followed by a rebounding reciprocal movement;

at least two electromagnetic coils coaxially aligned along an axis of the reciprocal movement of said ram-driver combination externally of said ram driver combination;

electrical circuit means connected to said coils to control current to said electromagnetic coils to produce a magnetic field with said coils and consecutively activate said coils to accelerate said ram-driver combination to obtain maximum hitting momentum at the end of the forward reciprocal movement of said ram-driver;

said ram-driver combination including a ram and a driver;

said ram including

a hollow round bar having a flange on one end;

said driver including

a flat impact rod integrally connected to a front end of said ram;

means to slow down said ram during the rebounding reciprocal movement by absorption of momentum including

heavy-weight metal particles of a predetermined amount confined inside said hollow round bar and adapted for forward movement with the forward reciprocal movement of said ram but lagging behind said movement of said ram by force of inertia and causing said ram on the rebounding reciprocal movement to move against the forward moving particles

whereby collisions of said particles will absorb the momentum of said ram-driver combination during the rebounding reciprocal movement.

4,618,088

PROCESS FOR SOLDERING A CURRENT CONNECTING ELEMENT AND A CURRENT FEED CONDUCTOR OF A HEATABLE GLASS PANE

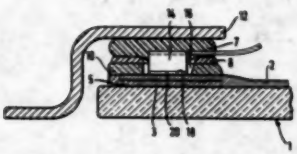
Heinz Karla, Herzogenrath, Fed. Rep. of Germany, assignor to Saint Gobain Vitrage, Courbevoie, France

Filed Dec. 7, 1984, Ser. No. 679,170

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1983, 3344958

Int. Cl.[4] B23K *1/19, 1/20*

U.S. Cl. 228—124 **6 Claims**



1. A process for soldering a current connecting element to an enamel-like, electrically conducting layer burnt onto a surface of a glass pane, said electrically conducting layer being disposed on an enamel-like layer which is, in turn, located between the surface of the glass pane and the electrically conducting layer, said process characterized in treating the surface of the electrically conducting layer with a fluorine containing etching agent, said treatment being at the place provided for soldering, and soldering a foot of the current connecting element to said electrically conducting layer at said treated surface.

4,618,089

APPARATUS AND METHOD FOR ASSEMBLING A STRUCTURE COMPRISING FRAMES AND SHELL PLATES

Sadashi Hanada, Miki, and Akira Nakabayashi, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Aug. 28, 1984, Ser. No. 645,172

Claims priority, application Japan, Aug. 30, 1983, 58-158864

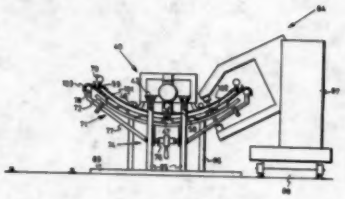
Int. Cl.[4] B23K *37/04*

U.S. Cl. 228—212 **2 Claims**

1. A method of assembling a structure consisting of a plurality of frames and at least one shell plate on said frames, comprising the steps of:

clamping the plurality of frames in given relative position to each other on a rigid clamping structure by releasable clamping means mounted on said clamping structure;

mounting the at least one shell plate in a predetermined form on a stand;



placing the assembled frames while clamped on said clamping structure on the at least one shell plate mounted on the stand so that said shell plate and said frames have a given relative position;

welding the frames while clamped on said clamping structure to the at least one shell plate mounted on the stand;

and releasing the clamping means and thereby the frames from the clamping structure.

4,618,090

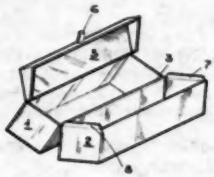
ONE PIECE DOUBLE SHELL BOX WITH CLOSURE FASTENER

Giancarlo Cortellucci, Civitanova Marche, Italy, assignor to Studio Tecnico A.C. s.r.l., Italy

Filed Apr. 24, 1984, Ser. No. 603,354

Int. Cl.[4] B65D *6/00*

U.S. Cl. 229—45 R **2 Claims**



1. A one piece box which may be tipped back to open for packing industrial products, particularly footware, comprising,

first and second shells, each said shell having an open part with said two open parts facing each other when said shells are positioned to provide a closed box,

a base wall common to both said shells and having a median longitudinal axis,

means for joining said shells and for providing for rotation of said shells located along said median longitudinal axis of said base wall,

each said shell including an opposite wall parallel to said base wall, and having an edge parallel to said median longitudinal axis of said base wall,

a closure member pivotally joined to said first shell along said opposite wall edge,

said closure member having a wall surface and three side walls perpendicular to said wall surface and directed toward said second shell, and

said wall surface being sized to fit over said second shell opposite wall so that when said open parts are positioned to provide a closed box, said closure member provides means positioned to enclose said second shell opposite wall.

4,618,091
APPARATUS FOR CONTROLLING THE PASSAGE OF A LIQUID

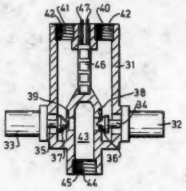
Guenter Buzzi, Schiltach, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany

Filed Apr. 2, 1985, Ser. No. 718,872

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1984, 3414481

Int. Cl.⁴ G05D *23/13*

U.S. Cl. 236—12.12 **17 Claims**



1. A sanitary mixing valve for controlling the mixing ratio of liquids of differing temperatures and generating electrical power comprising:

a casing having two fluid inlet means and a fluid outlet means;

thermocouple means within said casing at least zonally separating the differing liquids in said casing;

at least one valve means having variable passages and arranged in said casing for controlling passage of said liquids in admixture through said outlet means, said valve means having an electrical valve drive associated therewith and operatively connected to said thermocouple means; and

an electronic control unit for producing signals for controlling the operation of said valve means, whereby flow of liquids of differing temperature through said casing causes the thermocouple to produce a voltage for activation of said electronic control unit.

4,618,092
REFRIGERANT FLOW RATE CONTROL DEVICE

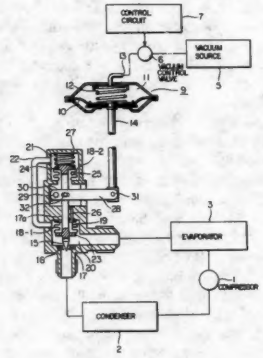
Toshihiko Fukushima, Ibaraki; Seigo Miyamoto, Takahagi; Masahiko Fujita, Ibaraki; Masanori Musoo, and Kosaku Sayo, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 29, 1984, Ser. No. 676,320

Claims priority, application Japan, Nov. 30, 1983, 58-224148

Int. Cl.⁴ G05D *27/00*

U.S. Cl. 236—92 B **2 Claims**



1. A refrigerant flow rate control device for effecting control of the flow rate of a refrigerant released from a condenser and for introducing said refrigerant to an evaporator while causing same to undergo adiabatic expansion, comprising:

means including an orifice for providing a passage for refrigerant to flow through;

a valve body extending into said passage downstream of said orifice and having one end positioned in proximity to said orifice and operative to change its position relative to the orifice to vary the cross-sectional area of said passage to control the stream of refrigerant flowing through said passage;

a valve drum for supporting said orifice and said valve body and having said passage extending therethrough;

seal means for sealing a portion of the valve drum through which the valve body extends;

a vacuum actuator mounted on said valve drum for controlling displacements of said valve body, said valve body extending through said vacuum actuator and being connected thereto so as to be actuated thereby;

a pressure chamber provided with seal means and located opposite said valve drum from said vacuum actuator and having positioned therein the opposite end of said valve body from the end operatively associated with said orifice; and

a communication passageway extending between said pressure chamber and a point in said passage downstream of said orifice for equalizing the fluid pressure applied to the downstream part of said passage through which the valve body extends and the fluid pressure in said pressure chamber.

4,618,093
RAIL INSULATION PADS

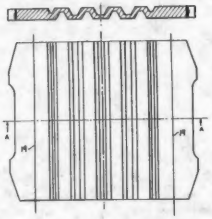
Hartley F. Young, West Melton, and John Collins, Ingle Farm, both of Australia, assignors to Ralph McKay Limited, Maidstone, Australia

Filed Jun. 20, 1984, Ser. No. 622,863

Claims priority, application Australia, Dec. 13, 1983, PG2833/83; Dec. 20, 1983, PG2923/83

Int. Cl.⁴ E01B *9/30, 21/04, 29/24*

U.S. Cl. 238—283 **12 Claims**



1. In a rail fastening system of the kind in which a rail is fastened to a rail tie by a rail seat comprising a rail pad between the tie and the rail; said rail having a longitudinal axis and a rail flange terminating in a field edge; a pair of rail clamp supports secured to said tie on either side of said rail and abutting said rail pad; rail clamp associated with each rail clamp support each clamp having a portion secured in said clamp support and a portion bearing down on said rail flange, and a clamp insulator lying on said rail flange to electrically insulate said rail flange from said rail clamp and said clamp support, the improvement comprising said rail pad being provided to electrically and dynamically insulate said rail tie from said rail which pad is composed of material having a spring rate sufficiently high to provide required load bearing capacity, said pad having field edge portions extending 20 mm inwardly from the field edge of the rail toward the longitudinal axis of the rail which are reduced in volume by less than 10% by the provision of grooves and recesses which remove material in either

pad surface and said pad having a control portion between said field edge portions which is reduced in volume by at least 15% by the provision of grooves and recesses which remove material in either pad surface, said pad being composed of a resilient, flexible material having a hardness within the range 68 to 90 DURO-Hardness on the shore-A scale.

4,618,094

THRUST DEFLECTION

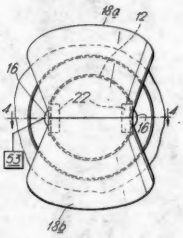
Charles R. Palmer, Nottingham, England, assignor to Rolls-Royce plc, London, England

Filed Jun. 26, 1984, Ser. No. 624,745

Claims priority, application United Kingdom, Jul. 5, 1983, 8318199

Int. Cl.[4] B64C *9/38*; F02K *1/62*

U.S. Cl. 239—265.37 **6 Claims**



1. A gas turbine engine having a jet pipe of the constant outlet opening type with a a thrust deflector movably connected thereto comprising:

a pair of deflector doors which when inoperative are positioned opposite each other diametrically of the jet pipe and being movable through arcuate paths relative to the jet pipe to further positions in which they provide said thrust deflector, said doors in said inoperative position defining a frustum of a cone and in said operative position their downstream extremities abut to define a plane which contains their pivot axis and their combined shapes providing a profile which is narrower in the middle than at its extremities; and

a pair of flaps pivotally fixed to the downstream extremity of the jet pipe at positions opposite each other diametrically of the jet pipe for movement into and out of the efflux and the pivot axes of the flaps being normal to and intersecting said plane which contains the pivot axis of the deflector doors, means for normally maintaining said flaps pivoted out of the efflux and for moving said flaps into said efflux when said deflector doors are in the operative position, when moved into said efflux said flaps constricting the flow of said efflux into said deflectors.

4,618,095

ELECTROMAGNETIC UNIT FUEL INJECTOR WITH PORT ASSIST SPILLDOWN

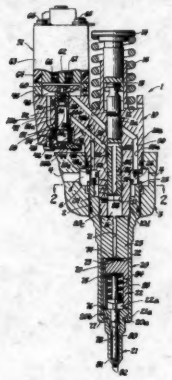
Gregg R. Spoolstra, Hudsonville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1985, Ser. No. 751,004

Int. Cl.[4] F02M *47/00*

U.S. Cl. 239—90 **3 Claims**

1. In an electromagnetic unit fuel injector, for injecting fuel into the combustion chamber of an engine, the injector being of the type that includes a housing means having at one end thereof a cylinder with an externally actuated plunger reciprocable therein between a suction stroke and a pump stroke and defining with the cylinder a pump chamber open at one end and the housing means having a spray discharge means at its opposite end, a supply/drain passage means in said housing means with one end thereof in flow communication with said pump chamber and its opposite end being connectable to a source of fuel at a predetermined supply pressure with flow therethrough controlled by a solenoid actuated control valve means, a discharge passage means in said housing means effecting flow communication between said pump chamber and said spray discharge means and, a pressure actuated injector valve means operatively positioned in said housing means to control flow discharge from said spray discharge means, the improvement wherein: said housing means further includes a spill passage means therein having one end thereof in flow communication with said supply/drain passage means and having its other end defining a spill annulus means opening into said



cylinder at a predetermined axial extent from the open end of said pump chamber and wherein said plunger is provided with a spill port means in flow communication at one end with said pump chamber and at its other end is adapted to come into flow communication with said spill annulus after a predetermined pump stroke of said plunger whereby said spill passage means and said spill port means will be operative to assist the solenoid actuated control valve means to effect the rapid spill of injection pressure at a predetermined injector output and engine operating speed above which fuel can no longer be effectively added to the combustion process in the combustion chamber.

4,618,096

WINDOW WASHER FOR VEHICLE

Yasuo Kondo; Masakane Watanabe, both of Okazaki, and Takao Oshiro, Toyoake, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Oct. 1, 1984, Ser. No. 656,523

Claims priority, application Japan, Oct. 11, 1983, 58-189641

Int. Cl.[4] B05B *1/08*

U.S. Cl. 239—101 **4 Claims**

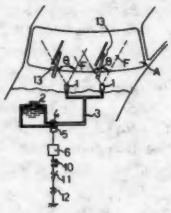
1. A window washer comprising:

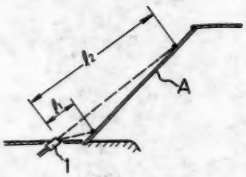
a washer liquid jet nozzle comprising a fluidic oscillator provided on a vehicle body under a windshield glass for periodically deflecting the jetting direction of a washer liquid leftwards and rightwards;

a washer liquid supply passage connecting a washer liquid tank to said fluidic oscillator for supplying said washer liquid to said fluidic oscillator; and

pressure applying means provided in said washer liquid supply passage for periodically changing the pressure of said washer liquid supplied to said fluidic oscillator, said pressure applying means comprising a pump provided in

said washer liquid supply passage for pumping said pressurized washer liquid; a driving motor for driving said





pump; and a motor control circuit for periodically changing a voltatge to be applied to said driving motor.

4,618,097

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

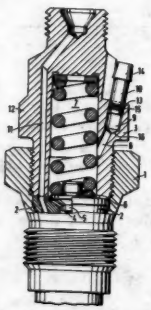
Karl Hofmann, Remseck; Walter Mladek, Stuttgart, and Bernhard Kaczynski, Waiblingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 200,655

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1979, 2943745

Int. Cl.[4] F02M *61/16*

U.S. Cl. 239—124 **3 Claims**



1. In a fuel injection nozzle for internal combustion engines having a nozzle holder provided with a pressure connection extending axially thereof, said nozzle holder further including a spring chamber and at least one leakage oil connection grommet communicating via first and second oil leakage bores with said spring chamber, said grommet disposed in said first oil leakage bore on a radial wall reinforcement of the nozzle holder embodied specifically by a wrench hexagon, the improvement wherein:

said nozzle holder further includes a jacket region which radially surrounds said spring chamber; and

said wrench hexagon and said jacket region includes said first and second leakage oil bores which are disposed in sequence and discharge directly into said spring chamber, said second oil leakage bore being of a smaller diameter and inclined more sharply than said first oil leakage bore toward said spring chamber, said second oil leakage bore arranged to branch off eccentrically from a base of said first bore, and

said first oil leakage bore has an inlet area arranged to receive said grommet and further that said grommet has a peripheral portion forming a knurled area and adapted to be grasped by said inlet area on insertion of said grommet into said inlet area.

4,618,098

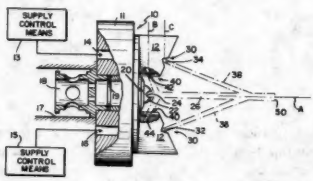
FIBERGLASS SPRAY NOZZLE

James E. Hedger, Jr., and Joseph G. Charette, both of Goshen, Ind., assignors to Graves Spray Supply, Inc., Goshen, Ind.

Filed Nov. 4, 1983, Ser. No. 548,632

Int. Cl.[4] B05B *7/06*

U.S. Cl. 239—290 **19 Claims**



1. A fluid spray nozzle apparatus for use in airless, low pressure spraying of resin-catalyst mixtures to combine multiple intermixing fluid streams to form a continuous, substantially flat sheet fluid stream, comprising:

resin nozzle means for low pressure, airless spraying of resin fluid as a resin stream for external atomization, said resin nozzle means having an oval opening to initially flatten said resin stream;

catalyst nozzle means for spraying of catalyst as a catalyst stream for intersecting and intermixing with said resin stream;

control air nozzle means for directing control air flow to intersect said resin stream adjacent said resin nozzle means and upstream and spaced apart from said intersection of said catalyst stream with said resin stream such that said resin stream is further flattened by said control air and formed without tail or split flows; and

said catalyst stream intersects said resin stream downstream from said subsequent to the flattening of said stream by said oval opening and said control air, said flattening of said resin stream also serving to enhance said intermixing of said catalyst stream with said resin stream.

4,618,099

ELECTRIC SPRAY

Tadasu Nagao, and Shigeharu Sayama, both of Fukuoka, Japan, assignors to Kyushu Hitachi Maxell, Ltd., Fukuoka, Japan

Filed Jul. 11, 1985, Ser. No. 753,971

Claims priority, application Japan, Jul. 13, 1984, 59-106730[U]; Aug. 10, 1984, 59-123301[U]; Jan. 12, 1985, 60-3606

Int. Cl.[4] B05B *9/043*

U.S. Cl. 239—332 **7 Claims**

1. An electric spray comprising:

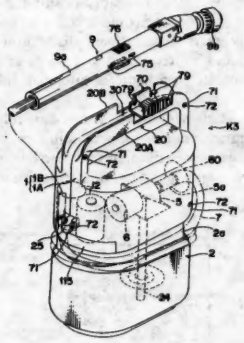
a spray casing which accommodates therein a pump and a motor for driving said pump and is provided with a grip;

said grip being formed with a recess extending in a longitudinal direction of said grip;

a tank which is mounted on said spray casing;

a nozzle member which is connected, through a tube, with a discharge portion of said pump so as to be detachably fitted into said recess; and

a slide switch for effecting on-off control of power supply to said motor, which is slidably mounted on said grip so as to be slid in the longitudinal direction of said grip;



said slide switch being formed with a hollow for receiving said nozzle member;

said slide switch, when said nozzle member has been received by said hollow, being at least partially exposed outwardly.

4,618,100

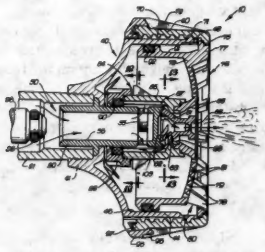
MULTIPLE PATTERN SPRAY NOZZLE

Glenn S. White, Canoga Park; Karl J. Mussler, Alta Loma, and Gary A. Van Exel, Fullerton, all of Calif., assignors to Rain Bird Consumer Products Mfg. Corp., Glendora, Calif.

Filed Nov. 27, 1984, Ser. No. 675,357

Int. Cl.[4] B05B *7/02, 1/36*

U.S. Cl. 239—440 **36 Claims**



1. A multiple pattern spray nozzle for connection to a supply of water under pressure and adjustable to provide a plurality of different spray patterns, said spray nozzle comprising:

a generally hollow nozzle housing having a rearward end for receiving a flow of water, and generally open forward end, and an internal seal surface bounded on the forward end thereof by a recessed flow channel;

a stem unit within said nozzle housing including an elongated hollow stem having an open rearward end for receiving the water flow into said nozzle housing and at least one flow port for passage of water flow from said stem;

a preferate faceplate supported on said nozzle housing generally over the forward end thereof and having first and second nozzle outlets of different geometry formed therein;

an inner flow control member extending from said faceplate into said nozzle housing in a generally rearward direction in surrounding relation with said stem and cooperating therewith to define a first flow path therebetween and further cooperating with said nozzle housing to define a second flow path therebetween, said inner flow control member being in generally surrounding relation with said first nozzle outlet;

an inner seal means acting between said inner flow control member and said stem for coupling said stem flow port to said first water flow path for water discharge through said first nozzle outlet when said inner seal means is in a first position rearward relative to said stem flow port and for coupling said stem flow port to said second flow path for water discharge through said second nozzle outlet when said inner seal means is in a second position forward relative to said stem flow ports;

an outer flow control member extending from said face place into said nozzle housing in spaced relation therewith and in surrounding relation with said first and second nozzle outlets, said faceplate having a third nozzle outlet formed therein outside said outer flow control member, and outer seal means for sealing engagement between said outer flow control member and said nozzle housing seal surface when said inner seal means is in the first and second position; and

means for shifting said inner seal means between said first and second positions and for shifting said outer seal means to a forward position relative to said nozzle housing seal surface while said inner seal means is positioned forward relative to said stem flow port to permit water flow through said recessed flow chamber for discharge through said third nozzle outlet.

4,618,101

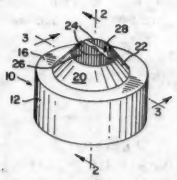
SPRAY NOZZLE

Richard G. Piggott, 936 Marshall Ave., Bellwood, Cook County, Ill. 60104

Filed Nov. 25, 1983, Ser. No. 554,779

Int. Cl.[4] B05B *1/02*

U.S. Cl. 239—589 **6 Claims**



1. A spray nozzle tip assembly for spraying a fluid material from a spray gun onto an object, said nozzle tip being adapted to be received within a spray gun, comprising, a generally cylindrical body having a portion adapted to be received in position of use with respect to an associated spray gun, said nozzle tip body having an inlet end and outlet end and including an axial bore extending from said inlet end and terminating prior to said outlet end, said inlet end of said nozzle body being positioned in the gun to establish a fluid communication between said nozzle tip body and the spray gun; said nozzle tip body further including a nose portion which is generally tapered toward and terminates in an end face, said end face being located at said outlet end; said end face also having a transverse groove cut therein; said groove intersects said axial bore to form an outlet opening or orifice through which the fluid material from the spray gun will exit to contact the object to be sprayed; said orifice being recessed from said end face; said

nose portion including margin portions lying adjacent to and radially outwardly of said end face; said margin portions and said end face defining an external surface finish portion of said nozzle tip; and said external surface portion of said nozzle tip being highly polished to a non-adherent generally smooth surface of not more than a three micro-inch (RMS) surface roughness, said smooth surface being operative to substantially reduce or prevent the collection and resultant drying and build up of fluid material on said nozzle tip surface.

4,618,102

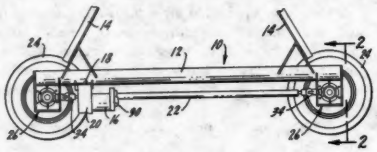
DRIVE FOR MOVABLE IRRIGATION SYSTEM AND THE LIKE

Charles H. Meis, Albion, and Duane B. Overvaag, Columbus, both of Nebr., assignors to Lindsay Manufacturing Company, Lindsay, Nebr.

Continuation-in-part of Ser. No. 588,376, Mar. 12, 1984, abandoned. This application Jun. 29, 1984, Ser. No. 626,546

Int. Cl.[4] A01G *25/00*

U.S. Cl. 239—737 **13 Claims**



1. A support tower for use in a self-propelled irrigation system which includes an elongated water distribution pipe supported at intervals by movable towers, each tower including a generally upright, elongated frame with a ground engaging wheel on each end for movement over a field to be irrigated, a hub mounted on one end of the frame and extending laterally outwardly from one side thereof, a gear box separately mounted on the hub, the gear box including a housing with a rotatably mounted input shaft, a motor to rotate the input shaft, an output shaft extending from the housing along the housing axis through the hub, a wheel being mounted on the outer end of the output shaft, and a gear assembly in the housing disposed on the housing axis and interconnected between the input and output shafts to provide a decrease in speed of rotation and an increase in torque between the input and output shafts, the gear box being disconnectably mounted on the hub and separate from the connection of the hub to the frame so that the gear box may be removed for service and/or repair without the weight of the tower having to be taken off of the hub and wheel.

4,618,103

HOSPITAL WASTE DISPOSAL SYSTEM

Joseph H. Wilson; David N. Lasiter, both of Indianapolis, and Randall G. McKee, Yorktown, all of Ind., assignors to Medical Safetec, Inc., Indianapolis, Ind.

Filed Oct. 12, 1983, Ser. No. 541,140

Int. Cl.[4] B02C *13/09, 9/04, 19/12*; F24H *1/00*

U.S. Cl. 241—41 **12 Claims**

1. A waste disposal system for treating and disposing of infectious waste articles in a substantially controlled closed and sealed aseptic circuit and for converting said infectious waste articles into a safely disposable noninfectious and non-toxic residue through the thorough disintegration and disinfection of such articles, said system comprising:

waste article feeding means for transferring said waste articles to waste article delivery means operably attached thereto,

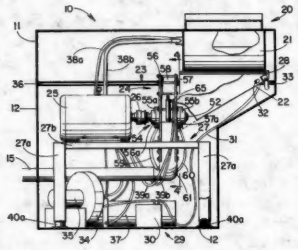
disintegrator means operably positioned to receive said waste articles from said waste article delivery means for disintegrating said waste articles into substantially small waste particulate for further treatment and disposal of same by said waste disposal system;

said disintegrator means comprising a rotary hammermill for violently disintegrating said waste articles at a substantially high speed, into a waste particulate-disinfectant solution:

said rotary hammermill means being powered by hammermill motor means operably coupled thereto;

disinfectant spray means operably positioned adjacent one or more of said waste article feeding means, said waste article delivery means and said disintegrator means for enveloping and impregnating said waste articles and said waste particulate in a bacteria killing disinfecting liquid solution,

liquid-solid particle separation means operably attached to said disintegrator means for separating, on a substantially continuous basis, said disintegrated particles of solid waste from said enveloping and impregnating disinfectant liquid;



said liquid-solid particle separation means including operable connections to liquid evacuation means and solid particulate evacuation means for continuous disposal of said disinfectant liquid and batch disposal of said solid waste particulate respectively; and

system vacuum means operably associated with said disposal system for creating a negative pressure within said system for effectively precluding the inadvertent release of bacteria and other contamination during the treatment and disposal of said waste articles by said system;

said system vacuum means cooperating with said liquid-solid particle separation means to exhaust any such bacteria or contaminant laden air emanating thereinto from said rotary hammermill means to in turn, exert a negative pressure on the substantially closed and sealed circuit created by said waste article feeding means, said waste article delivery means, and said disintegrator means leading into said liquid-solid particle separation means.

4,618,104

STRAND TRANSFER

Leslie J. Harris, Waterloo, Canada, assignor to Fiberglas Canada Inc., Toronto, Canada

Filed Dec. 4, 1985, Ser. No. 804,393

Claims priority, application Canada, Jul. 24, 1985, 487399

Int. Cl.[4] B65H *54/02, 67/04*

U.S. Cl. 242—18 G **16 Claims**

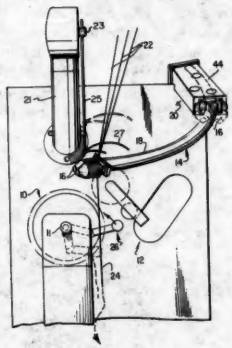
1. Strand transfer apparatus for supplying a strand to a winding collet of a strand winding machine, said strand transfer apparatus comprising:

a pair of pull rolls for receiving the strand therebetween;

first drive means for rotationally driving said pull rolls to advance the strand;

movable support means for carrying said pull rolls between a standby position in which said pull rolls are spaced from said winding collet to facilitate insertion of the strand between said pull rolls and a wind-on position in which

said pull rolls guide said strand closer to said winding collet; and



second drive means for displacing said support means and therewith said pull rolls to and fro between said standby position and said wind-on position.

4,618,105

ROLLER WINDING MACHINE ATTACHING AND SERVING APPARATUS

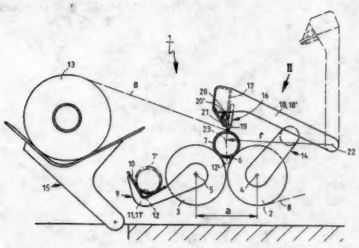
Friedrich Kuhn, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Aug. 3, 1984, Ser. No. 637,437

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1983, 3328516

Int. Cl.⁴ B65H *18/20, 19/26, 19/28*

U.S. Cl. 242—56 R **3 Claims**



1. A double support roller winding machine for winding material webs onto core tubes with different diameters to form wound rolls, said machine having at least two support rollers, a roller bed defined by said support rollers, loading means for inserting core tubes into said roller bed and unloading means for removing wound rolls from said roller bed, wherein the improvement comprises an attaching and severing means mounted for pivotal movement about a first axis from a rest position above said roller bed to a work position in engagement with the apex of the core tube in said roller bed, said attaching and severing means comprising means for attaching the web to the core tube in said roller bed and means for severing the fully wound roll ejected from said roller bed from the attached web start, said first pivot axis lying at a distance from and parallel to the axis of rotation of said support rollers whereby the path of travel of the attaching and severing means about said first pivot axis is such that the attaching and severing means engages each core tube inserted into said roller bed at the apex of the core tube irrespective of its diameter.

4,618,106

FISHING REEL WITH FRICTION AND MAGNETIC BRAKES

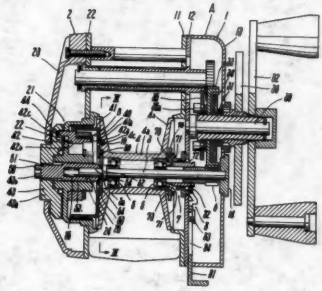
Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 27, 1984, Ser. No. 604,595

Claims priority, application Japan, Apr. 27, 1983, 58-63332

Int. Cl.⁴ A01K *89/02*

U.S. Cl. 242—84.5 R **2 Claims**



1. A fishing reel comprising:

(a) first and second side frames,

(b) a spool shaft supported between said first and second side frames,

(c) a spool supported rotatably to said pool shaft by means of a pair of bearings, said first and second side frames being respectively positioned at opposite axial sides of said spool,

(d) a drive mechanism for driving said spool,

(e) a clutch for releasing said spool from said drive mechanism,

(f) cast-control means for controlling casting of said reel to set said spool in free rotation, said cast-control means comprising a cast-control member which is supported to said second side frame positioned at one axial side of said spool and substantially coaxial with said spool shaft, said cast-control member being movable axially of said spool and having an actuating portion extending outside said second side frame,

(g) a contact member held non-rotatably at an axial outer face of said spool such that said contact member does not rotate relative to said spool, said contact member having a substantially flat annular contact portion adjacent a radially central part of said spool and surrounding said spool shaft for contacting an end face of said cast-control member, said contact member being positioned so that when said cast-control member is moved axially with respect to said spool, said cast-control member contacts said contact member and applies a rotation-resisting force by means of said contact member to said spool with respect to free rotation thereof, said spool shaft including a receiving flange for receiving inward deformation of said contact member and said receiving flange being positioned on said spool shaft at a position outside said bearings which rotatably support said spool and between said contact member and a said bearing.

4,618,107

FISHING REEL

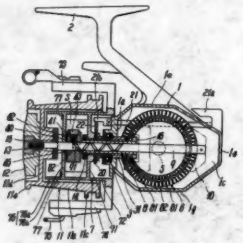
Hideki Nakajima, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Dec. 8, 1981, Ser. No. 328,691

Claims priority, application Japan, Dec. 16, 1980, 55-181277[U]; Dec. 16, 1980, 55-181278[U]

Int. Cl.[4] H01K *89/01*

U.S. Cl. 242—84.21 R 7 Claims



1. A fishing reel comprising a reel body having a front wall and side walls, a rotary frame disposed in front of the front wall of said reel body and having a first tubular shaft journalled to said reel body, a spool disposed in front of the front wall of said reel body and having at the center a spool shaft which passes through said first tubular shaft; a handle supported to one of said side walls at said reel body; a transmission mechanism for transmitting rotation of said handle to said rotary frame, said transmission mechanism including a master gear and first means for coupling said master gear to said first tubular shaft; and a reciprocation mechanism for moving said spool shaft in reciprocation longitudinally of said reel body; said rotary frame having a support plate, a cylindrical body, and a pair of support arms, said cylindrical body having therein an inner space; said reciprocation mechanism comprising a traverse groove provided at the outer periphery of said spool shaft and a second tubular shaft disposed between said spool shaft and first tubular shaft, and second means for coupling said second tubular shaft to said master gear, said first means for coupling said first tubular shaft to said master gear being separate from said second means for coupling said second tubular shaft to said master gear, said second tubular shaft having an edge extending outwardly from said front wall into said inner space, said edge being connected to an engaging member engageable with said traverse groove, said engaging member being disposed within said inner space, being fixed against axial movement along said spool shaft, and rotating together with said rotary frame upon rotation of said handle.

4,618,108

SAFETY BELT REEL-IN MECHANISM HAVING A TENSIONING ARRANGEMENT

Klaus Butenop, Herzhorn, and Doris Kröger, Elmshorn, both of Fed. Rep. of Germany, assignors to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,640

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407378

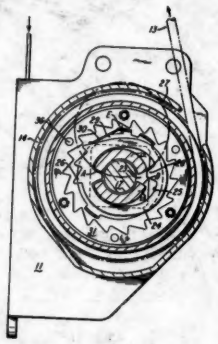
Int. Cl.[4] B65H *75/48;* B60R *22/46*

U.S. Cl. 242—107 16 Claims

1. A safety belt reel-in mechanism having a tensioning arrangement, including a piston which is acted upon by pressure medium and which is disposed at a distance relative to the belt reeling-in shaft of said belt reel-in mechanism; when said tensioning arrangement is triggered, said piston being connected with said belt reeling-in shaft by means of a cable drive, which includes a cable pulley for receiving a drive cable which is connected to said piston and to said cable pulley;

the improvement in combination therewith comprising: said cable pulley being mounted on an extension of said belt reeling-in shaft, a spring-loaded locking member disposed on said cable pulley; said locking member having a central opening and being held on said cable pulley, in the direction of rotation of the latter, by means of a spring arm which is mounted on said cable pulley and engages the periphery of said locking member; and,

elements provided on said belt reeling-in shaft, with said locking member engaging said elements, when said tensioning arrangement is triggered, in order to operatively connect said cable pulley and said belt reeling-in shaft to effect tensioning of said safety belt; said last-mentioned connection being disconnected after termination of the tensioning arrangement-engagement so that thereafter said belt reeling-in shaft is freely rotatable relative to said cable pulley, and ring segments projecting from the plane of said cable pulley and having spaces disposed therebetween, said central opening extending around said ring segments.



4,618,109

WING TRAILING EDGE AIR DAMS

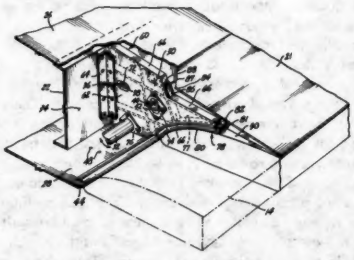
Paul F. Victor, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

PCT No. PCT/US82/01717, § 371 Date Dec. 6, 1982, § 102(e) Date Dec. 6, 1982, PCT Pub. No. WO84/02320, PCT Pub. Date Jun. 21, 1984

PCT Filed Dec. 6, 1982, Ser. No. 474,654

Int. Cl.[4] B64C *3/00, 7/00*

U.S. Cl. 244—130 10 Claims



1. Air dam means disposed within the interior of the trailing edge portion of a wing, the wing including a fixed wing structure and movable rear flap extending rearwardly from the fixed wing structure, the fixed wing structure and the rear flap

cooperatively defining an interior wing rear cavity extending spanwise along the wing, said air dam means comprising:

a first dam in the form of a wall structure having a generally planar shape closely corresponding to the chordwise profile of the interior wing rear cavity, said wall structure stationarily attached to the fixed wing structure in a generally upright, planar position to extend generally transversely chordwise across the interior wing cavity formed by the fixed wing structure and the wing flap to define a rearward marginal edge portion contoured to generally correspond to the adjacent profile of the rear flap;

sealing means mounted on said wall structure along said rearward marginal edge portion to seal against the rear flap; and,

said wall structure and said sealing means cooperating to block substantially all air from flowing spanwise past air dam means between higher and lower relative pressure regions of the interior wing cavity.

4,618,110

QUICK RELEASE LOCK FOR A PARACHUTE

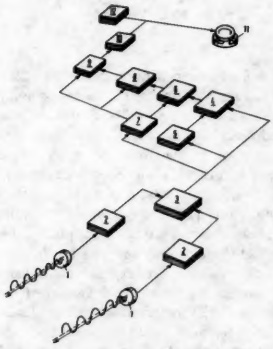
Herbert Just, Hohnstorf, and Holger Hansen, Hamburg, both of Fed. Rep. of Germany, assignors to Autoflug GmbH, Relligen, Fed. Rep. of Germany

Filed Nov. 20, 1984, Ser. No. 673,468

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1983, 3342092

Int. Cl.[4] B64D *17/38*

U.S. Cl. 244—151 B **11 Claims**



1. Quick-release lock for a parachute for automatically releasing the parachute from the load carried by it, particularly a person, when the descent of the parachute is ended when reaching a surface, this lock comprising:

a measuring device for continuously measuring the distance from the surface;

comparing means connected to the measuring device for repeatedly comparing, during at least a part of the descent, the measured distances with an ordered set of predetermined values indicative of the actual distances from the surface which should be measured during this part of a normal descent; and

triggering means connected to the comparing means for releasing the parachute from the load when the descent is ended only if the comparing means indicate that the measured distances agree with the predetermined values.

4,618,111

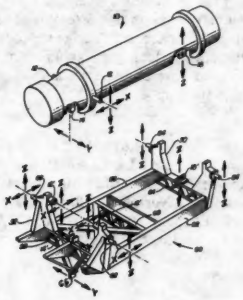
SPACECRAFT STRUCTURE FOR SUPPORTING AN OPTICAL BENCH

Duane D. Sherwood, and John J. Conway, both of Torrance, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed May 8, 1984, Ser. No. 608,331

Int. Cl.[4] B64G *1/22*

U.S. Cl. 244—158 R **18 Claims**



1. A spacecraft suitable for supporting as a payload any of a variety of optical benches, the spacecraft having a longitudinal axis referred to as the x axis, a transverse axis referred to as the y axis, and a z axis orthogonal to the x and y axes, the spacecraft comprising:

a rigid platform having two upstanding posts between which the payload is to be supported;

a pair of trunnion supports mounted on the posts and providing coupling to the payload, to react to loads in x and z axes only; and

a pair of keel supports mounted on the platform, and spaced apart along the x axis, to provide reaction to loads only in the y and z axes, respectively;

whereby any deformtions to the spacecraft are not transferred to the payload, which is still supported by constraints in six degrees of freedom, and spacecraft subystems are mountable on the spacecraft and not the payload.

4,618,112

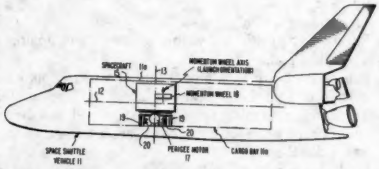
SPACECRAFT ANGULAR MOMENTUM STABILIZATION SYSTEM AND METHOD

John E. Keigler, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 15, 1983, Ser. No. 485,294

Int. Cl.[4] B64G *1/10, 1/28*

U.S. Cl. 244—158 R **8 Claims**



1. A method for placing a spacecraft in orbit from the cargo bay of the space shuttle or orbiter type craft where the satellite is mounted in an ejection direction perpendicular to the longitudinal axis of the shuttle craft and where said spacecraft and a perigee motor are fixed to each other to form a spacecraft-/perigee motor assembly comprising the steps of:

providing said spacecraft from a momentum wheel that has a spin axis in the launch direction;

spinning said momentum wheel so that the momentum vector is parallel to the ejection direction of the spacecraft's/-perigee motor assembly when said assembly is separated from the shuttle craft;

ejecting the non-spinning spacecraft/perigee motor assembly from said shuttle craft imparting a linear velocity to the assembly in said ejection direction while the inertial stability of the momentum wheel assures the orientation of said satellite/perigee motor assembly; and

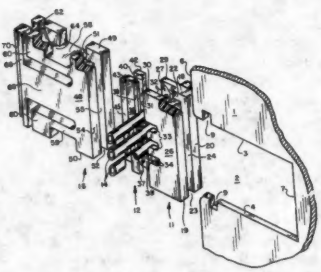
after ejecting the spacecraft/perigee motor assembly from the shuttle craft reducing the spinning of said momentum wheel to zero whereby the resultant spacecraft/perigee assembly is spun up.

4,618,113

CABLE CLAMP

William A. Reimer, Wheaton, Ill., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Sep. 13, 1985, Ser. No. 776,190
Int. Cl.[4] F16L *5/00*
U.S. Cl. 248—56 **13 Claims**



1. A clamp for restraining thereat at least one cable passing through a planar surface near an edge thereof, said clamp comprising:

a slot extending inward of said planar surface from said planar surface edge, said slot including an inner edge and each of said first and said second parallel side edges orthogonal to said a slot inner edge;

at least one catch formed in each of said first and second slot side edges, said catches positioned opposite each other and at an identical fixed distance from said slot to said inner edge;

a clamping anvil positioned within said slot adjacent to said inner edge;

a clamping pad positioned within said slot adjacent to said anvil, said cable positioned between said pad and said anvil; and

a latch member including

a latch body positioned within said slot and against said clamping pad,

a pair of latch arms each of flexible construction, extending from said latch body adjacent and parallel to a respective one of said slot side edges and in a direction away from said slot inner edge, each latch arm including a distal end,

a latch finger extending from said latch arm distal end in a direction parallel to said slot inner edge and toward a respective one of said panel slot side edges, said fingers each engaging said respective panel slot side edge catches to lock said latch member within said slot and clamp said cable, and

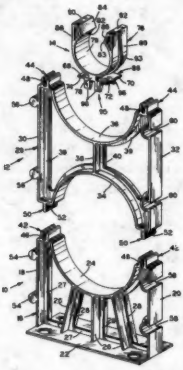
a groove formed in each of said latch arms extending from said latch arm finger a fixed distance in a direction towards said latch body, said latch arm grooves each engaging a corresponding one of said lot side edges to guide and maintain said latch fingers within said slot catches, said latch member engaging said slot to exert a force on said pad thus to clamp said cable between said pad and said anvil.

4,618,114

CONDUIT SPACER AND SUPPORT

James H. McFarland, Leonard, Mich., assignor to LOF Plastics Inc., Troy, Mich.

Continuation of Ser. No. 426,935, Sep. 29, 1982. This application Mar. 13, 1985, Ser. No. 709,999
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—65 **5 Claims**



1. A conduit holder comprising: a generally planar base; a generally U-shaped body connected to said base and having an open end extending away from said base; the exterior surfaces of said U-shaped body curving away from said base on either side of the connection to said base so as to define a space between said base and exterior surfaces providing for deflection of the ends of said planar base toward said U-shaped body; said body having a interior diameter approximately equal to the outside diameter of a conduit to be supported thereby; the open end of said U-shaped body terminating in a pair of opposed portions, the spacing between which is less than the outside diameter of said conduit, said U-shaped body being made of a resilient material to permit spreading of said opposed portions for receipt of said conduit into said body; and means connected to said base and extending away from said U-shaped body detachably securing said holder to an arcuate side member, said base, said U-shaped body and said securing means comprising an integral one piece structure formed of a resilient plastic material and said securing means comprising at least one pair of spaced opposed legs extending from opposite sides of said base; said legs having opposed inner wall surfaces formed with inwardly directed shoulders adapted for snap-fitted engagement astride and under said arcuate side member; said base extending longitudinally beyond said legs with at least the ends of said base adapted for engagement with said arcuate member, the distance between the innermost reach of said inwardly directed, opposed shoulders being less than the width of said arcuate side member, and the distance between said shoulders and said base being substantially greater than the thickness of said arcuate side member so as to accommodate arcuate side members having different degrees of curvature.

4,618,115

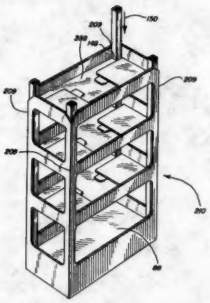
DISPLAY DEVICE MODULE WITH MULTIPLE SHELVES

Paul Belokin, Jr., P.O. Box 1907, Denton, Tex. 76201

Filed Oct. 1, 1984, Ser. No. 656,362

Int. Cl.[4] A45D *19/04*

U.S. Cl. 248—174 **12 Claims**



1. A collapsible display device comprising:

a wall blank having substantially flat wall panels connected end to end foldably relative to each other to define a continuous wall structure,

said wall blank collapsible to a flattened state for storage and transportation and convertible to an expanded display state in which pairs of opposed, facing wall panels cooperatively bound a storage space;

first and second substantially flat flaps associated with each of the wall panels of one said wall panel pair;

means attaching each of the first and second flaps associated with each of the wall panels of the one wall panel pair foldably relative to its respective wall panel; and

means interconnecting the first and second flaps on one of the wall panels of the one wall panel pair with the first and second flaps on the other of the wall panels of the one wall panel pair so that the first and second flaps of the one wall panel pair are situated in overlying facial engagement with one another and define first and second spaced shelves within the storage space for placement of articles to be displayed.

4,618,116

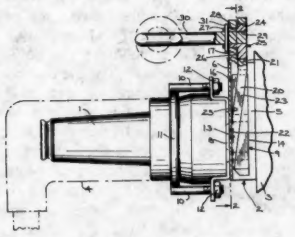
QUICK LATCH MOUNTING BRACKET

Allen L. Johnson, Mukwonago, Wis., assignor to RTE Corporation, Brookfield, Wis.

Filed Jun. 18, 1984, Ser. No. 621,452

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—222.1 **20 Claims**



1. A quick latch mounting device for securing a standoff device to a standoff bracket, the combination comprising:

actuator means including an actuator member movable in a first plane;

a mounting member attachable to a standoff device and movable in a second plane transverse to said first plane between a first position clamped to a standoff bracket and a second position unclamped with respect to a standoff bracket; and

a clamping member operatively coupled to said actuator member and said mounting member and operable upon movement of said actuator member to translate the movement of said actuator member in said first plane into the movement of said mounting member in said second plane.

4,618,117

WALL MOUNT FOR AN ACCESSORY

Helmut Gerbe, Iserlohn, Fed. Rep. of Germany, assignor to KEUCO Paul Keune GmbH & Co. KG, Hemer, Del.X

Filed Dec. 7, 1983, Ser. No. 559,177

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1983, 3323571

Int. Cl.[4] F16B *7/00*

U.S. Cl. 248—222.1 **4 Claims**

1. A wall mount for an accessory, comprising

(a) a base plate;

(b) means for affixing said base plate to a wall surface;

(c) a cover extending over said base plate in an assembled state of the wall mount; said cover including a throughgoing opening forming a first bearing having a bearing axis; said cover including a second bearing in alignment with said first bearing; and

(d) clamping means for releasably tightening said cover to said base plate in the assembled state of said wall mount; said clamping means including

(1) a receiving part affixed to said base plate and having an inner cylindrical wall defining a cylindrical space; and

(2) a bolt having opposite first and second journal ends for being rotatably supported in said first and second bearings, respectively; said first and second journal ends having a common journal axis coinciding with said bearing axis; said bolt being rotatably supported in said first and second bearings and forming a unitary structure with said cover; said first journal end having a radial end face provided with a face portion shaped for engagement by a turning tool in the assembled state of the wall mount; said bolt having a length portion being eccentric with respect to said bearing axis; said receiving part having an elongated opening through which said length portion of said bolt is radially introducible into said cylindrical space upon placing said cover and said base plate into the assembled state; in said assembled state said bolt having a first angular position in

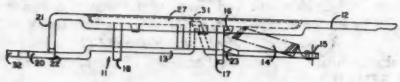
which said length portion of said bolt is clamped to said inner cylindrical wall whereby said cover is drawn against said base plate and a second angular position in which said length portion of said bolt is in a released condition with respect to said inner cylindrical wall.

4,618,118

RELEASABLY LOCKING

Michael A. Nardella, Millbury, and Bernard T. Cournoyer, Holden, both of Mass., assignors to Barry Wright Corporation, Newton Lower Falls, Mass.

Filed Apr. 8, 1985, Ser. No. 720,839
Int. Cl.[4] A47G *29/02*
U.S. Cl. 248—243 **8 Claims**



1. Apparatus for releasably locking comprising,
latch means for moving between locked and unlocked positions to selectively engage a mating aperture,
housing means including guide means for slidably supporting said latch means while allowing significant movement both along the length of said latch means and perpendicular to the plane thereof and having base means having a base panel generally parallel to the plane of said latch means with said base means for engagement with an end panel to be releasably locked by said apparatus,
said guide means allowing more movement along the length of than perpendicular to the plane of said latch means,
said housing means having travel limit means for limiting travel of said latch means along the length thereof,
said latch means having travel limit boss means for selective engagement with said travel means in a locked rearward position,
and spring means connected between said base means and said latch means located in the region between the plane of said latch means and said base panel for exerting a force on said latch means tending to urge said latch means both rearward along and sideward perpendicular to the latch means plane toward said base panel to keep said latch means travel limit boss means in engagement with said travel limit means when in said locked and unlocked positions.

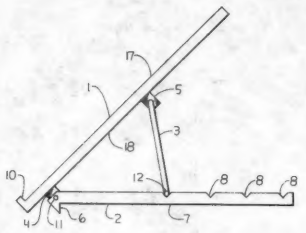
4,618,119

ADJUSTABLE INCLINATION READING/WRITING BOARD

Roger A. Powell, 1589 Vernon Rd., Norristown, Pa. 19401

Filed Sep. 19, 1984, Ser. No. 652,292
Int. Cl.[4] A47G *1/24*; A47B *97/08*
U.S. Cl. 248—456 **3 Claims**

1. A writing board of adjustable inclination to be used on a table top, comprising:
a. a planar member having: a front face; a bottom edge, perpendicular to said front face; a rear face, opposed to said front face; a first pivotal attachment means on said rear face, adjacent to said bottom edge, having an axis parallel to said bottom edge; a second pivotal attachment means on said rear face, having an axis parallel to said first pivotal attachment;
b. a plurality of base strip members having: a third pivotal attachment means at one end, coupled to said first pivotal attachment means on said planar member; a bottom face that contacts said table top, having a lip protruding downward, in proximity to said third pivotal attachment means, said lip contacting a vertical face of said table top; a top face, opposed to said bottom face, having multiple spaced engagement means;
c. a prop member coupled to said second pivotal attachment means on said planar member having means for engagement with said multiple spaced engagement means on said base strip members;
d. disengaging means for simultaneously disengaging all said engagement means between said prop member and said base strip members, whereby the inclination of said planar member may be changed; said disengaging means comprising an elongated member attached to said prop member at one end thereof opposite said second pivotal attachment means, an adjustment member having first and second ends and being mounted at said first end to a free end of said elongated member, said adjustment member having a fulcrum disposed thereon between said first and second ends for contacting said table top and having a manual operating surface at said second end.

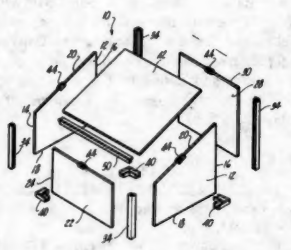


4,618,120

PORTABLE LECTERN

Jervis J. Wattles, 16231 W. 14 Mile Rd., Birmingham, Mich. 48009

Filed Feb. 25, 1985, Ser. No. 705,319
Int. Cl.[4] A47F *5/16*
U.S. Cl. 248—460 **7 Claims**



1. A lectern which can be disassembled to component pieces for storage and transportation including: a pair of trapezoidal side panels having one of the nonparallel sides formed at a right angle to the parallel sides to act as a base portion for the lectern, a rectangular front panel having one set of sides approximately the same size as the shortest of the parallel sides of the trapezoidal side panels and a width equal to the desired width of the lectern, a back panel having a pair of sides approximately equal to the length of the longest side of the trapezoidal side panels and the second sides of the back panel being equal to the width of the lectern, a plurality of joining strips, the joining strips having a first set of parallel lips extending along the side of the panel, the lips being spaced and adapted to grip the edge of a panel, and a second set of parallel lips disposed at right angles to the first lips and adapted to extend along and grip the edge of a second panel juxtaposed the panel held by the first lips, a top panel disposed on a slanted plane formed by

the upper edges of the assembled panels, and fastening means adapted to hold the top panel on the assembled base.

4,618,121

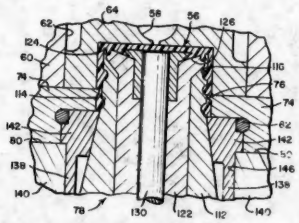
MOLD FOR FORMING PLASTIC CAP WITH PERFORATION ABOUT THE PERIPHERY OF THE SKIRT

Vincent N. Conti, West Hempstead, N.Y., assignor to American Safety Closure Corp., Farmingdale, N.Y.

Filed Aug. 15, 1984, Ser. No. 640,899

Int. Cl.[4] B29C *45/26, 45/33, 45/44*

U.S. Cl. 249—59 **7 Claims**



1. A mold for forming a plastic cap having a side wall and a ring spaced from the side wall by means of circumferentially spaced annular recesses and connected to the side wall by frangible members, the mold comprising:

(a) a female member forming a socket and an orifice for conducting plastic material into the socket;

(b) a male member having at least two portions including a core assembly axially extending into the socket to form a mold cavity with the female member

(i) an inner portion of said male member adapted to be independently axially movable from its position forming a part of said mold cavity; and,

(ii) an outer portion of said male member being fixed in its position forming a part of said mold cavity;

(c) the female member including

(i) an upper assembly forming an upper portion of the socket, and

(ii) a lower assembly having a plurality of radially movable cam members forming a lower portion of the socket, the cam members having radial protrusions engaging circumferentially spaced sections of the core assembly of the male member to form the circumferentially spaced recesses in the cap.

4,618,122

CORE SEGMENT FOR CONCRETE FORMING APPARATUS

Richard Kraiss, Laichingen-Suppingen, Fed. Rep. of Germany, assignor to Georg Prinzing GmbH & Co. KG Betonformen- und Maschinenfabrik, Blaubeuren, Fed. Rep. of Germany

Filed Jan. 24, 1985, Ser. No. 694,641

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1984, 3422980

Int. Cl.[4] B28B *7/30*

U.S. Cl. 249—94 **36 Claims**

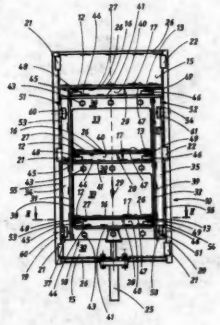
1. A core segment for molding equipment used in forming concrete parts which are provided with at least one projecting element, particularly a climbing element, such as a climbing iron, stirrup or the like, which during a forming process is cemented from the inside into the concrete parts which are to be formed, the core segment comprising:

a wall portion having an inside face, a plurality of apertures having upper and lower edges and housings for supporting the projecting elements;

clamping means associated with said housings for clamping projecting elements;

a clamping drive associated with and engaging said clamping means;

reinforcing ribs provided on said inside face of said wall portion and extending inwardly from and transversely to said wall portion, said clamping means including associated clamping devices and a common clamping frame located on said wall portion, said housings for the projecting elements and said associated clamping devices being located on said common clamping frame, said clamping means further including guide means for said clamping frame so that, upon actuation of said clamping drive, said clamping frame being guided for movement between a release position and a closed position in a direction parallel



with said wall portion, said wall portion having a shape, and said clamping means further including facing plates, one of said facing plates being provided for each of said aperture, disposed on said inside face of said wall portion and having a shape corresponding to the shape of said wall portion at least in the region of a respective aperture, each said facing plate having a surface area sufficiently large so that in said closed position of said clamping frame said facing plate entirely covers said aperture, sealing it off tightly, said facing plates each having a back, and a horizontal web to which said facing plates are fixed at said back, said clamping frame having a cross-strut and said horizontal web having a rear web fixed to said cross-strut at a distance from said facing plate.

4,618,123

VALVE SYSTEM FOR A HYDRAULICALLY CONTROLLED STARTING FRICTION CLUTCH

Manfred Bilharz, Bergheim; Peter Heider, Weilerswist; Hartmut Röper, Bochum; Martin Taal; Fritz Henken, both of Pulheim; Ernst Kohl, Cologne, and Dietmar Schubert, Hennef, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 11, 1985, Ser. No. 710,265

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1984, 3410512

Int. Cl.[4] F16D *25/14*

U.S. Cl. 251—28 **2 Claims**

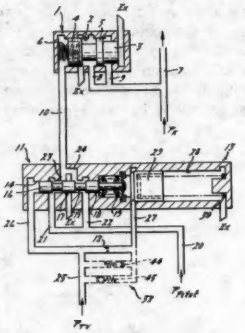
1. In a fluid pressure operated clutch control circuit;

a pressure regulator valve having a pressure supply passage communicating with a fluid pressure clutch feed passage, said regulator valve having an exhaust port, a feed back pressure port and a pressure signal port, a regulator valve element and a spring acting on said valve element;

a shuttle valve, a clutch input speed pressure signal passage communicating with said shuttle valve, an output port for said shuttle valve communicating with said pressure signal port, said shuttle valve having opposed lands and adapted to shift from one position to another to establish and

interrupt communication with said clutch input speed pressure signal passage;

an input torque pressure signal passage communicating through branch passages with said opposed lands, one branch passage having a flow restricting orifice;



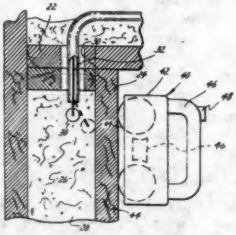
an accumulator having an expandable volume chamber communicating with the downstream side of said orifice and with the land of said shuttle valve that communicates with said one branch passage.

4,618,124

METHOD OF INSTALLING CONDUIT

Thomas Flowers, 1069 E. York, Flint, Mich. 48505

Division of Ser. No. 491,154, May 4, 1983, Pat. No. 4,527,775.
This application May 6, 1985, Ser. No. 730,913
Int. Cl.[4] E21C *29/16*
U.S. Cl. 254—134.3 FT **4 Claims**



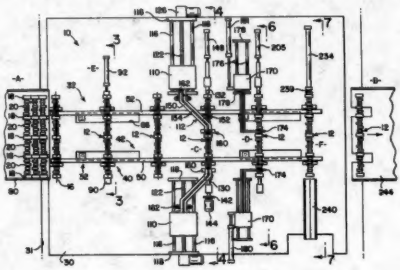
1. A method for installing conduit in a confined space behind a wall between points of access to the confined space which comprises: introducing into the confined space at one point of access, one end of a tape having a magnetically responsive roller means on said one end; said tape being coiled on a drum disposed exteriorly of the confined space near said one point of access, magnetically attracting said roller means toward said wall by an attracting magnet positioned on the side of said wall opposite the confined space; moving said magnet along said wall to another point of access and thereby, through the attractive force of said magnet on said roller means causing said roller means to roll on the surface of said wall which is on the interior of the confined space also drawing the tape through the confined space to said another point of access, said tape having sufficient length to extend between said two points of access; securing conduit to said one end of said tape at said another point of access; and turning said drum to withdraw said tape from the confined space via said one point of access, thereby to draw the conduit from said another point of access to said one point of access.

4,618,125

SYSTEM FOR HARDENING CAMSHAFTS

Norbert R. Balzer, Boaz, Ala., assignor to Tocco, Inc., Boaz, Ala.

Filed Aug. 26, 1985, Ser. No. 769,399
Int. Cl.[4] C21D *9/30*
U.S. Cl. 266—90 **6 Claims**



1. An apparatus for hardening axially spaced cams of an elongated camshaft having an axis of rotation and a plurality of cams axially spaced along said axis and with the cam lobes of each cam having an axially outwardly projecting tip at a preselected circumferentially orientation, said apparatus comprising:

(a) a first induction heating coil having a generally circular inner surface and an electrically insulating gap at a selected location on said inner surface of said first heating coil;

(b) a second induction heating coil having a generally circular inner surface and an electrically insulating gap at selected location on said inner surface of said second heating coil;

(c) a first power supply for energizing said first heating coil;

(d) a second power supply for energizing said second heating coil;

(e) means for mounting said one of said camshafts with said axis extending through said first heating coil;

(f) means for causing relative movement of said one camshaft axially with respect to said first coil until one of said cams is within said first coil;

(g) means for circumferentially indexing said one camshaft with respect to said first coil until said tip of said axially aligned cam is adjacent said electrically insulating gap of said first coil;

(h) first energizing means for energizing said first coil by said first power supply while said cam of said one camshaft is in its circumferentially indexed position;

(i) means for quench hardening said cam of said one camshaft while said cam of said one camshaft is within said first heating coil;

(j) means for heating another cam of one of said camshafts said second heating coil by said second power supply before said cam of said one camshaft is quench hardened, including means for axially shifting said another cam into said second heating coil and second energizing means for energizing said second coil with said second power supply;

(k) means for quench hardening said another cam while said other cam is within said second heating coil;

(l) means for then indexing a first subsequent unhardened cam axially into said first heating coil and a second subsequent unhardened cam into said second heating coil; and,

(m) means again actuating said first and second energizing means to heat said first and second subsequent cams with said first and second heating coils, respectivley.

4,618,126
SWIVELLING SLIDING CLOSURE UNIT

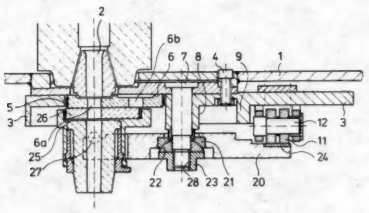
Bernhard Tinnes, Zollikerberg; Bernhard Knell, Thalwil, and Walter Vetterli, Winterthur, all of Switzerland, assignors to Metacon AG, Zurich, Switzerland

Filed Jun. 24, 1985, Ser. No. 748,043

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1984, 3423156

Int. Cl.⁴ B22D *41/08*

U.S. Cl. 266—271 **11 Claims**



1. A swivelling sliding closure unit for controlling the discharge of molten metal from a metallurgical vessel, said unit comprising:

a stationary refractory plate having a discharge opening;

a stationary housing to be fixed to the bottom of a metallurgical vessel and supporting said stationary refractory plate in a position with said discharge opening thereof in alignment with an outlet opening of the metallurgical vessel;

a swivel pin fixed to said stationary housing;

a swivel lever having first and second ends;

gimbal bearing means supporting said swivel lever at a portion thereof between said first and second ends to enable said swivel lever to universally rotate about said swivel pin;

a movable refractory plate having therethrough a discharge opening;

means at said first end of said swivel lever for supporting said movable refractory plate in position against said stationary refractory plate and for enabling said movable refractory plate to pivot with respect to said swivel lever about a pivot axis;

means for rotating said swivel lever about said swivel pin and thereby for sliding said movable refractory plate with respect to said stationary refractory plate between a first position whereat said discharge opening of said movable refractory plate is aligned with said discharge opening of said stationary refractory plate, a second position whereat said discharge openings are out of alignment, and a replacement third position;

a rolling element mounted on said stationary housing;

a raceway formed on said second end of said swivel lever and abutting said rolling element during rotation of said swivel lever about said swivel pin;

clamping means for removably mounting said swivel lever on said swivel pin and for urging said movable refractory plate toward said stationary refractory plate and said raceway toward said rolling element; and

bracket means, hingedly connected to said stationary housing and connectable to said swivel lever when said swivel lever is in said replacement third position, for, upon removal of said clamping means, swinging said swivel lever and said movable refractory plate away from said swivel pin and said stationary refractory plate to an open position enabling replacement of said refractory plates.

4,618,127
CONNECTING DEVICE BETWEEN THE STRUCTURE OF A VEHICLE AND A SUSPENSION STRUT

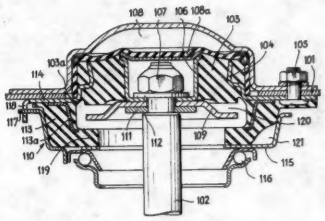
Robert Le Salver, Chanteloup les Vignes, and Dominique Poupard, Chaville, both of France, assignors to Automobiles Peugeot, Paris and Automobiles Citroen, Neuilly-sur-Seine, both of, France

Filed May 14, 1984, Ser. No. 609,880

Claims priority, application France, May 16, 1983, 83 08089; Nov. 23, 1983, 83 18657

Int. Cl.⁴ B60G *15/06*; F16F *9/54*

U.S. Cl. 267—8 R **15 Claims**



1. A connecting device combined with and interposed between a structure of a vehicle and an upper element of a suspension strut which upper element is movable substantially along an axis relative to said structure, said device comprising a flexible joint including two frames, one of which frames is fixed to said upper element of the suspension strut while another of said frames is fixed to said structure, a resiliently yieldable sleeve interposed between and fixed to said two frames, said two frames being such as to allow said yieldable sleeve to undergo solely shear stress upon said movement of said upper element relative to said structure, a support element fixed to said structure, and an abutment element fixed to said upper element and cooperative with said support element, said abutment element being fixed to said upper element of the suspension strut below said flexible joint in spaced relation to said yieldable sleeve axially of said upper element, and said support element being disposed below said abutment element in spaced relation to said abutment element axially of said upper element so as to limit the downward movement of said abutment element and said upper element after a free travel of said abutment element relative to said support element in normal operation of the device.

4,618,128
TWO-CHAMBER ENGINE BEARING WHICH HAS HYDRAULIC DAMPING

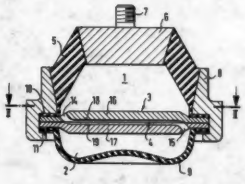
Volker Härtel, Germering, and Dieter Theisen, Unterschleisheim, both of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,708

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336966

Int. Cl.⁴ F16F *9/34*

U.S. Cl. 267—140.1 **11 Claims**



1. Two-chamber engine bearing with hydraulic damping,

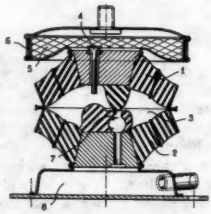
comprising rubber-elastic peripheral walls, a rigid, elastically-mounted intermediate plate defining an upper liquid-filled chamber and a lower liquid-filled chamber along with said peripheral walls, said intermediate plate having a cavity formed therein interconnecting said chambers with a substantially rectangular longitudinal section in vicinity of the central plane thereof and a length and width being many times the height thereof, said intermediate plate having a first vertical passage formed therein at one end of said cavity leading from said cavity to said upper chamber and a second vertical passage formed therein at the other end of said cavity leading from said cavity to said lower chamber.

4,618,129

VIBRATION DAMPING ARRANGEMENT

Jean-Pierre Bechu, Courbevoie, France, assignor to Caoutchouc Manufacture et Plastiques, Bezons, France

Filed Apr. 23, 1984, Ser. No. 603,150
Claims priority, application France, Apr. 22, 1983, 83 06612
Int. Cl.[4] F16F *9/04*
U.S. Cl. 267—140.1 **7 Claims**



1. A mount means for damping vibrations of a load having a vacuum source, the mount means comprising: means for defining a variable volume chamber means, said means for defining being formed of a thick-rubber material bonded to rigid reinforcement members, said means for defining being adapted to elastically support a force greater than the force applied by gravity so as to support the load in a predetermined static position, means for communicating the variable volume chamber means with either the vacuum source through a limited volume chamber means or atmosphere through another limited volume chamber means defined in part by a porous membrane, said communicating means being adapted to control a moderate pressure so that a displacement of the load generates in the mount means accelerating forces counteracting said displacement, said accelerating forces being limited to a comfortable acceptable value of about 0.2 times a value of the weight of the load, wherein said limited acceleration forces are produced by an intermediate balance, through rapid communication between the variable volume chamber means and either one of the limited volume chamber means thereby said variable volume chamber means progressively reaches atmospheric pressure through said porous membrane after being previously subjected to a maximum value of the vacuum source.

4,618,130

RESILIENT BLOCK FOR ATTACHING THE UPPER END OF A FRONT SUSPENSION SHOCK ABSORBER TO A VEHICLE BODY

Bartolomeo Veglia, Turin, Italy, assignor to Riv-Skf Officine Di Villar Perosa S.p.A., Torino, Italy

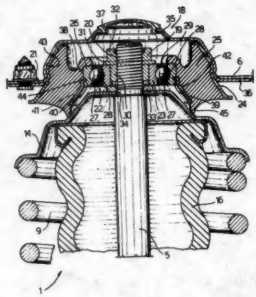
Filed Jun. 11, 1984, Ser. No. 619,361
Claims priority, application Italy, Jun. 23, 1983, 53494/83[U]
Int. Cl.[4] F16F *1/36*
U.S. Cl. 267—153 **5 Claims**

1. A resilient block for the attachment of a shock absorber of a suspension of a vehicle to a body thereof, comprising:

a. a rolling bearing comprising: an inner ring operable to be fixed to one end of said shock absorber, a cylindrical outer ring shaped like said inner ring and having a cylindrical outer lateral surface, and rolling bodies interposed between the inner and outer rings;

b. a first frusto-conical sleeve operable to be fixed to said vehicle body;

c. a second frusto-conical sleeve coaxial with the first sleeve and with said rolling bearing, said cylindrical outer lateral surface of said outer ring of the bearing having attachment means rigidly connecting said outer ring to said second sleeve, said attachment means including an annular groove formed on said cylindrical outer surface of said



outer ring, said second sleeve having a circular, radially-directed, inwardly folded rim engaging said annular groove; and

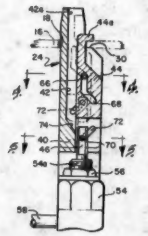
d. an elastomeric sleeve for resiliently joining said rolling bearing and said second sleeve to said first sleeve, respective conical inner and outer surfaces of said first and second sleeve, respectively, and said cylindrical outer lateral surface of said outer ring of the rolling bearing being directly and fixedly connected to said elastomeric sleeve to form with said outer ring, said first and second sleeves and said elastomeric sleeve, a single, substantially inseparable unit.

4,618,131

PC BOARD HOLD DOWN SYSTEM

Carl Campisi, Chicago, and Brian D. Kay, Arlington Heights, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed May 24, 1985, Ser. No. 738,137
Int. Cl.[4] B23Q *3/08*
U.S. Cl. 269—32 **10 Claims**



1. For use in the assembly of a PC board positioned upon and displaced by a transport mechanism as electronic components are positioned upon the PC board in predetermined locations on a first side thereof, clamp means for engaging and maintaining the PC board securely in position in a flat configuration upon the transport mechanism comprising:

a housing positioned on a second side of the PC board in a first retracted position, said housing including a linear slot aligned along the length thereof;

displacement means coupled to said housing for moving said housing between the first retracted position and a second extended position wherein said housing is positioned immediately adjacent to the PC board and extends to the first side thereof;

an arm positioned within the slot in said housing and movable along a first axis therein between a first retracted configuration and a second extended configuration in said housing, said arm including a distal hook portion recessed within said slot when said arm is in the first retracted configuration and extending outward from said slot when said arm is in the second extended configuration; and

actuation means coupled to said arm for displacing said arm to said second extended configuration when said housing is in said second extended position whereupon the distal hook portion of said arm engages the PC board on the first side thereof and pulls the PC board tightly against the transport mechanism in securely maintaining the PC board in a flat configuration during the positioning of components thereon and for displacing said arm to said first retracted configuration following the positioning of components on the PC board, whereupon the distal hook portion of said arm disengages the PC board and said displacement means moves the housing to said first retracted position to permit the transport mechanism to displace the PC board from said clamp means.

4,618,132

REAR WINDOW LIGHT SCREEN PARTICULARLY FOR AN AUTOMOBILE

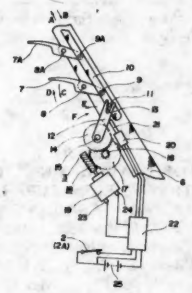
Ryoichi Kimura, Saitama; Kanji Nomura, Kawasaki; Kazumi Ubukata, Kawasaki, and Shinju Kasahara, Kawasaki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Kawasaki, Japan

Filed May 24, 1984, Ser. No. 613,739

Claims priority, application Japan, May 31, 1983, 58-83789[U]

Int. Cl.⁴ B60J *3/02*

U.S. Cl. 296—97 J **8 Claims**



1. A light screen device for selectively blocking light from entering through a window of an automobile comprising:

a plurality of screen vanes adjacent the window; and

means for rotating said vanes between a light blocking position and a light admitting position said rotating means comprising driving means operated selectively to cause rotation of said vanes between said light blocking and light admitting positions in response to a first signal from a position detection means, said signal indicating a light blocking and light admitting position of said vanes, and in response to a second signal indicating an on or off state of automobile ignition said driving means rotating said vanes to light admitting position when said first signal indicates said vanes are in the light blocking position and when said second signal indicates the on state of the ignition and said driving means rotating said vanes to the light blocking position when said first signal indicates said vanes are in the light admitting position and when said second signal indicates off state of the ignition.

4,618,133

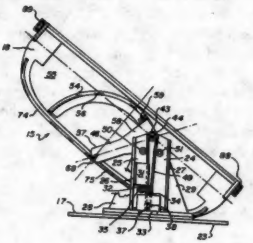
TABLE POSITIONER FOR RADIOGRAPHIC DEVICE

Bernard W. Siczek, Boulder, Colo., assignor to Fischer Imaging Corporation, Denver, Colo.

Filed Dec. 28, 1984, Ser. No. 687,437

Int. Cl.⁴ A61G *13/00*

U.S. Cl. 269—323 **17 Claims**



1. A system for positioning a table relative to a base, said system comprising actuating means connected with said base and including frame means having said table mounted thereon, said actuating means also including gear means connected with a drive mechanism and gear rack means mounted on said frame means and engaging said gear means, said gear rack means including a first gear rack having a first curvature and a second gear rack having a second curvature that is opposite to that of said first curvature, and said gear means including a first gear engagable with said first gear rack and a second gear engagable with said second gear rack so that said table is angularly displaceable in at least one direction from a horizontal position and with said actuating means causing displacement of said table by imparting a smooth translating motion to said table throughout said displacement.

4,618,134

AUTOMATIC PAPER SHEET SUPPLYING APPARATUS

Katsuhiko Kawaguchi, and Yoshiaki Ono, both of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 704,867

Claims priority, application Japan, Feb. 29, 1984, 59-37589; Mar. 12, 1984, 59-46876

Int. Cl.⁴ B65H *5/00, 29/60*

U.S. Cl. 271—4 **15 Claims**

1. An automatic paper sheet supplying apparatus to be used in combination with a paper sheet processing apparatus having a sheet passage opening provided in a housing, paper sheet processing means for processing paper sheets and paper sheet guide means for guiding a paper sheet coming from said sheet passage opening and also guiding a processed paper sheet coming from said paper sheet processing means to said sheet passage opening, comprising:

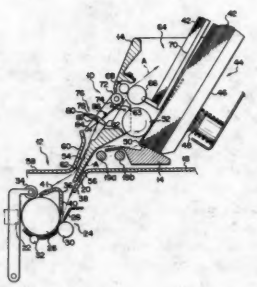
sheet holding means for holding a plurality of paper sheets and feeding out said plurality of paper sheets one after another;

a first stationary guide member with an end portion extending into said sheet passage opening of said paper sheet processing apparatus, said first stationary guide member having a first guide surface for guiding a paper sheet coming from said holding means to said sheet guide means of said paper sheet processing apparatus and a second guide surface for guiding a processed paper sheet from said paper sheet guide means through said sheet passage

opening to be discharged to the outside of said paper sheet processing apparatus and for also guiding a paper sheet, which is separate from the plurality of paper sheets held in said sheet holding means and is inserted into said sheet passage opening from the outside of said paper sheet processing apparatus to said sheet guide means to let the separate paper sheet be guided by said sheet guide means to said paper sheet processing means;

a second stationary guide member spaced from and facing said second guide surface of said first stationary guide member so as to define a passage between said second stationary guide member and said second guide surface of said first stationary guide member, said second stationary guide member guiding, in co-operation with said second guide surface of said first stationary guide member, a processed paper sheet discharged from said sheet passage opening and guiding said separate paper sheet inserted into said sheet passage opening;

an exit provided on an extension of said second guide surface of said first stationary guide member and discharging a processed paper sheet to the outside of said paper sheet processing apparatus;



a movable guide member provided adjacent to the inlet side of said exit and movable between an open position, at which said exit is open, and a closed position, at which said exit is closed, said movable guide member, when it is in said open position, being located on an extension of said second stationary guide member to guide a processed paper sheet discharged through said sheet passage opening and coming through said passage defined between said second guide surface of said first stationary guide member and said second stationary guide member to said exit; said movable guide member, when it is in said closed position, being located on the extension of said second guide surface of said first stationary guide member to guide said processed paper sheet coming through said passage defined between said second guide surface of said first stationary guide member and said second stationary guide member to the outside of said paper sheet processing apparatus and also guide said separate paper sheet from the outside into the space between said second guide surface of said first stationary guide member and said second stationary guide member; and

switch operation means for switching said movable guide member between said open position and closed position.

4,618,135

SHEET FEEDER PARTICULARLY FOR PRINTING PRESSES

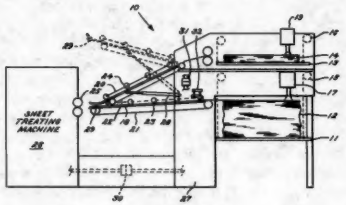
Harry Greiner, and Adolf Schwebel, both of Offenbach am Main, Fed. Rep. of Germany, assignors to MABEG Maschinenbau GmbH & Company, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,688

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1984, 3401724

Int. Cl.[4] B65H *5/24*

U.S. Cl. 271—9 **19 Claims**



1. A sheet feeder for the individual feeding of sheets to a sheet treating machine having a first sheet pile carried by a main pile table, a first sheet separating means for selectively feeding the respective uppermost sheet of the first sheet pile to the sheet treating machine, a second sheet pile carried by an auxiliary pile table, a second sheet separating means for selectively feeding the respective upper sheets of the second sheet pile in place of the sheets of the first sheet pile to the sheet treating machine, wherein the improvement comprises means for feeding the sheets to the sheet treating machine from the main pile table and the auxiliary pile table in the same rhythm, whereby on change of sheet feed from one to the other sheet pile, the sheet stream from the sheet pile, from which the sheet feeding was taking place, is interrupted in such a way and the sheet flow from the other sheet pile is put into operation in such a way that the sheet feed to the sheet treating machine is without interruption, and wherein the sheet feed takes place with an underlapped sheet stream, wherein the first sheet of the lapped stream of sheets from the first sheet pile can be slid under the last sheet of the lapped sheet stream from the second sheet pile.

4,618,136

DEVICE FOR LOADING SIGNATURES FOR APPLICATION TO SIGNATURE LOCATING ASSEMBLIES IN BOOKBINDING APPARATUS

Giorgio Pessina, and Aldo Perobelli, both of Via Timavo, 32, 20037 Paderno Dugnano, Milano, Italy

Filed Apr. 24, 1984, Ser. No. 603,437

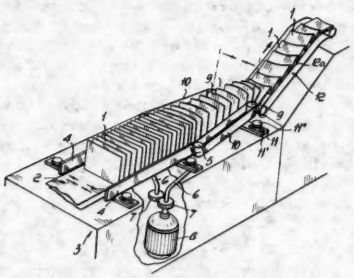
Claims priority, application Italy, May 6, 1983, 21765 B/83

Int. Cl.[4] B65H *1/30, 5/02*

U.S. Cl. 271—150 **5 Claims**

1. A signature loading device to be applied to signature loading apparatus for bookbinding machines comprising a conveyor belt for continuously feeding edge arranged signatures and provided with side guiding members for restraining and guiding said signatures, at the outlet end of said guiding members there being provided a narrowing width portion for bending said signatures with a convexity facing said signature feeding direction and for loading said signatures on a further upwardly slanted conveyor belt, said narrowing width portion engaging said signatures for a heigth substantially equal to that of said guiding members, said narrowing width portion consisting of a pair of endless driven opposite converging belts ar-

ranged as extensions of a respective said guiding member, each said converging belt extending between two vertical axis driving and driven rollers, the driven roller of said rollers being adjustably mounted on a respective slotted bracket member.



4,618,137

SHEET IMAGING APPARATUS

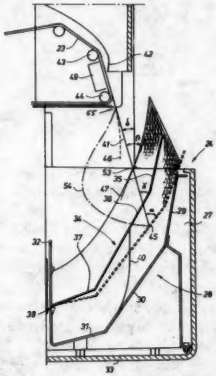
Gerard J. Boeve, Edegem, and Franciscus Vierveijzer, Mortsel, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Mar. 25, 1985, Ser. No. 715,939

Claims priority, application European Pat. Off., Mar. 30, 1984, 84200452.5

Int. Cl.[4] B65H *31/10*

U.S. Cl. 271—219 **4 Claims**



1. In a sheet imaging apparatus wherein sheets are taken in succession from a supply stack of such sheets, passed through an imaging station wherein an image is formed on the sheets, then are directed in inverted order along a generally vertical path into a collecting tray which has a sheet supporting back plate that is disposed at an acute angle with respect to the generally vertical path of said sheet, whereby the first contact of the leading end of a discharged sheet with the stack of sheets in the collector tray, or with the sheet supporting plate in the case of the first sheet received in the tray, occurs at an acute angle, and the sheet supporting back plate of said collecting tray is rockably mounted near its lower end and spring biased generally upward so that, as the tray fills with sheets, the back plate sinks down and the size of the acute angle between the sheet path and backplate increases, the improvement comprising an upper part of said back plate disposed at a greater angle with respect to the lower part of the plate so that the sheets received on the plate are flexed upwardly at their upper portion relative to their lower portion, the thickness of the upper stack end increasing over that of the lower stack end with the number of sheets received in the tray as a consequence of the inclusion of air between the sheets, so that the angle of incidence ($\beta,\gamma,\beta',\gamma'$) of a delivered sheet on the stack of collected sheets remains almost constant during the filling of the tray with sheets.

4,618,138

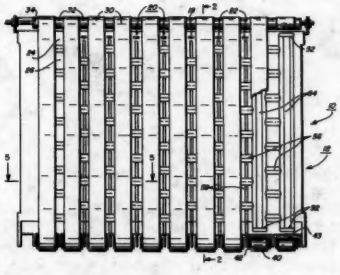
PLURAL BELT DOCUMENT FEEDER

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 17, 1985, Ser. No. 788,376

Int. Cl.[4] B65H *9/06, 29/24*

U.S. Cl. 271—245 **20 Claims**



1. In a document feeder for transporting document sheets over the platen of a copier, with a vacuum belt platen transport system, into registration means for stopping the document sheet at an imaging position on said platen, wherein the vacuum belt platen transport system comprises plural belts moving under a white backing surface overlying said platen, and includes a vacuum source with a vacuum plenum for applying a partial vacuum to a document sheet being transported by said moving belts, the improvement wherein:

said vacuum belt platen transport system belts are transparent or highly translucent thin, low-frictional, non-elastomeric, plastic belts,

said transparent or highly translucent belts being unapertured and said backing surface being unapertured in said imaging position, so that said vacuum belt transport system is effectively invisible through a document sheet to said copier,

said belts being spaced apart by defined gaps pneumatically connected by unapertured grooves in said unapertured backing surface with said vacuum source to apply vacuum forces to a document sheet through said gaps sufficient to provide transport of a document sheet with movement of said belts into said registration means, but with low enough said vacuum forces to allow slippage of a document sheet relative to said moving belts at said registration means.

4,618,139

EXERCISE MACHINE

Gary R. Haaheim, 112712 Hundertmark Rd., Chaska, Minn. 55318

Filed Dec. 21, 1984, Ser. No. 684,616

The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.

Int. Cl.[4] A63B *1/00, 69/18, 21/00*

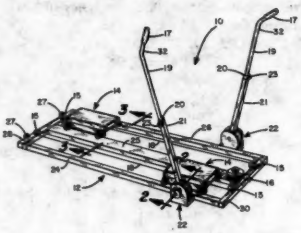
U.S. Cl. 272—70 **20 Claims**

1. An exercise machine for providing simultaneous exercise of arms and legs against adjustable frictional resistances, comprising

(a) a frame assembly having at least three parallel rails and having end members affixing said rails in spaced relationship;

(b) a pair of wheeled trucks, each of said trucks mounted between two parallel rails with each wheel on a rail for free rolling thereon;

(c) a plurality of rotatable pulleys attached to said frame assembly, each pulley being positioned proximate an end member, and a cable respectively attached to each of said trucks and guided by said pulleys;



(d) a first frictional clutch assembly attached on said frame assembly and attached to respective ends of said cable; and

(e) a pair of elongated handles, each pivotally mounted between a pair of plate members, at least one of said plate members being affixed to said frame assembly, and friction pads mounted intermediate said plate members and said handles, including means for selectively clamping said plate members against said friction pads and said handles.

4,618,140

PHYSICAL EXERCISING APPARATUS

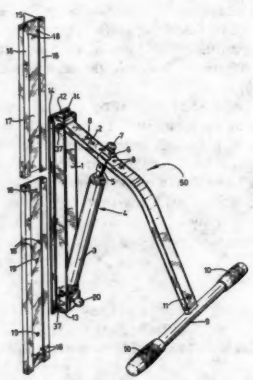
Peter L. Brown, 226 Springfield Road, Chelmsford, Essex, England

Filed Nov. 27, 1984, Ser. No. 675,343

Claims priority, application United Kingdom, Nov. 30, 1983, 8331900; Nov. 30, 1983, 8332027

Int. Cl.[4] A63B *69/06*

U.S. Cl. 272—72 **15 Claims**



1. A convertible physical exercising apparatus comprising a first frame structure adapted to be mounted generally vertically; a second frame structure separate from said first frame structure and being randomly located relative to the first frame structure but always oriented substantially perpendicularly to said first frame structure; an assembly separate and independent of said first and second frame structures and having a carrier member, a single lever one end of which is pivotally mounted on the carrier member, a pair of oppositely extending user handles mounted on the other end of the lever and extending substantially transversely thereto, which handles are adapted to be grasped by the user to move the lever, and means on the carrier member engaging the single lever at a position intermediate its ends for resisting pivotal movement of the lever; and means for detachably securing said assembly in turn to said first and second frame structures in orientation substantially perpendicular one to the other whereby wall exercises can be performed when the assembly is secured to the first frame structure and other forms of exercises can be performed when the assembly is secured to the second frame structure.

4,618,141

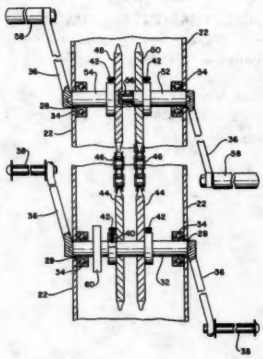
THERAPEUTIC EXERCISE DEVICE

Thomas Ashworth, Jr., 2145 Maplewood Rd., Stow, Ohio 44224

Filed Apr. 12, 1985, Ser. No. 722,603

Int. Cl.[4] A63B *23/04*

U.S. Cl. 272—73 **4 Claims**



1. An exercise device of the type having

a base,

a raised seat connected to the base, and

a pair of hand cranks and a pair of foot cranks rotatably mounted on support means connected to the base, and comprising:

a shaft, a double sprocket mounted on said shaft, said foot cranks being operably connected to said shaft and fixed in their position relative to each other, a separate shaft for each handcrank, each carrying a single sprocket, said handcrank shaft sprockets being of different diameters; and

a drive means interconnecting each handcrank sprocket to one of the double sprockets said device producing equal angular velocity in each of the foot pedals, and different angular velocities in each of the handcranks, and said device having the capability of being pedalled in reverse.

4,618,142

JUMPROPE APPARATUS HAVING WEIGHTED BAR

Tony Joseph, Jr., Johnstown, Pa., assignor to Jog & Lift Development Co., Johnstown, Pa.

Filed Jan. 22, 1985, Ser. No. 693,134

Int. Cl.[4] A63B *5/20, 13/00*

U.S. Cl. 272—75 **14 Claims**

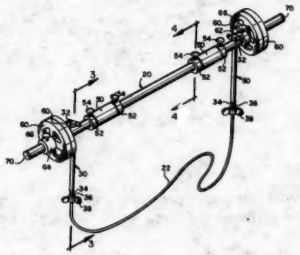
1. An exercise device, comprising:

a bar for grasping intermediate opposite ends thereof, the bar defining an axis;

hand grips including tubes rotatable around the bar and means for axially retaining the tubes on the bar;

a plurality of weights disposed at said opposite ends of the bar, and means for axially retaining the weights on the bar;

a pair of standoff rods, each attachable to the bar by one end and aligned perpendicular to the bar, parallel to one another and spaced from said opposite ends of the bar, the



rods having compression fittings at free ends remote from the bar; and

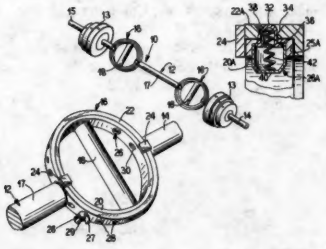
a flexible line attaching said stand off rods, the flexible line being attached to said stand off rods at the compression fittings at the free ends thereof, whereby a user can exercise by simultaneously skipping the flexible line and manipulating the bar bearing said weights.

4,618,143

WEIGHT LIFTING BAR

Brian Twardosz, 12941 Exchange, Chicago, Ill. 60633

Filed Dec. 10, 1984, Ser. No. 679,869
Int. Cl.[4] A63B *13/00*
U.S. Cl. 272—123 **4 Claims**



1. In a bar with a longitudinal axis having opposed end portions receiving selectively removable weights, a central portion and two spaced hand grip portions each inboard of said end portions and outboard of said central portion, said hand grip portion comprising:

an outer ring member secured on one peripheral side to said outer portion and on opposite peripheral side to said central portion;

said outer ring member having a plurality of spaced apertures therethrough around its periphery;

an inner ring member concentrically captured in said outer ring member and being free to rotate relative to said outer ring member;

said inner ring member having at least one aperture therethrough selectively alignable with said apertures in said outer ring;

a retaining means extendable through said aperture in said inner ring and said aligned aperture in said outer ring to selectively secure said two rings against relative rotation;

a cylindrical hand grip member extending across said inner ring and being secured thereto;

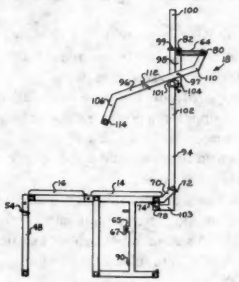
whereby, said hand grip member can be selectively rotated relative to said bar and retained in said selected position to permit various exercises to be performed without removal of said weights from said bar.

4,618,144

PORTABLE EXERCISE DEVICE

Christopher S. Gibson, 403 St. Ronan St., New Haven, Conn. 06511

Filed Nov. 9, 1984, Ser. No. 669,680
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **28 Claims**



1. A self-contained portable exercise device for performing upper and lower body exercises readily convertible into an interconnected compact hand transportable portable configuration comprising,

a freestanding support frame having a ground-engaging base and a substantially horizontally extending upper portion for mounting a horizontal seat member, said upper portion being spaced from said base so as to form a storage space therebetween, said support frame having opposed forward and rearward ends,

a horizontal seat member securely mounted to said upper portion of said support frame and having forward and rearward ends, said seat member being of sufficient length for sitting exercises and insufficient length for prone-supine bench exercises,

a bench extension member movably mounted to said support frame at said rearward end of said seat member for movement between a first position in horizontal alignment with said seat member to form an elongated bench with said seat member of sufficient length for prone-supine bench exercises and a second position extending adjacent said storage space for transport and storage,

means for securely supporting said bench member in said first position for bench exercises and for disposition within said storage space when said bench extension member is in said second position,

an upper body exercise assembly means for performing upper body exercises without weights,

support extension means for selective vertically adjustable mounting of said upper body exercise assembly means substantially above said seat member,

said support extension means being detachably mounted to said support frame so as to extend vertically upwardly therefrom and alternately detachably mountable to said support frame substantially within said storage space in the compact portable configuration,

said upper body exercise assembly means being detachably adjustably mountable to said support extension means

above said seat member for performing upper body exercises on said elongated bench and alternately detachably mountable to said support frame substantially within said storage space in the compact portable configuration,

a lower body exercise assembly means for performing lower body exercises without weights being detachably mountable to said support frame at said forward end of said seat member for performing lower body exercises and alternately detachably mountable to said support frame substantially within said storage space in the compact portable configuration, and

said upper body exercise assembly means, said support extension means and said lower body exercise assembly means being simultaneously mountable to said support frame substantially within said storage space when said bench extension member is in said second position to form the compact portable configuration for transport and storage.

16. A self-contained exercise device in a compact, hand-transportable configuration and readily assemblable for performing upper and lower body exercises comprising

a freestanding support frame having a substantially horizontally extending upper portion, an opposed spaced apart lower ground-engaging base, and opposed forward and rearward ends, said base and said upper portion forming a storage space therebetween,

a horizontal seat member securely mounted to said upper portion of said support frame and having forward and rearward ends, said seat member being of sufficient length for sitting exercises and insufficient length for prone-supine bench exercises,

said base and said upper portion with said seat member defining substantially the perimeter of said storage space with said seat member and said upper portion defining substantially the uppermost portion of said exercise device and said base defining substantially the lowermost portion of said exercise device,

a bench extension member mounted to said support frame so as to extend along the perimeter of said storage space, said bench extension member being mountable to said support frame at said rearward end of said seat member in horizontal alignment with said seat member to form an elongated bench with said seat member of sufficient length for prone-supine bench exercises,

an upper body exercise assembly means for performing upper body exercises without weights, said upper body exercise assembly means being positioned substantially within said storage space and detachably mounted to said support frame,

support extension means for selectively vertically adjustably mounting said upper body exercise assembly means substantially above said seat member, said support extension means being positioned substantially within said storage space and detachably mounted to said support frame,

said support extension means being alternately detachably mountable to said support frame so as to extend vertically upwardly therefrom and said upper body exercise assembly means being alternately detachably adjustably mountable to said support extension means so as to be disposed above said seat member for performing upper body exercises on said elongated bench, and

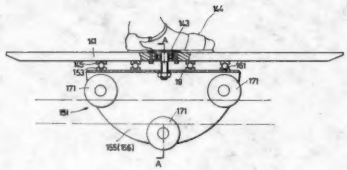
a lower body exercise assembly means for performing lower body exercises without weights, said lower body exercise assembly means being positioned substantially within said storage space and detachably mounted to said support frame, said lower body exercise assembly means being alternately detachably mountable to said support frame for performing lower body exercises.

4,618,145

PHYSICAL TRAINING APPARATUS

Taichi Inada, 120-banchi, 1-chome, Niwai-chou, Sumiyoshi-ku, Osaka City, Japan

Filed Mar. 25, 1985, Ser. No. 715,968
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—146 **6 Claims**



1. A physical training apparatus comprising:

a supporting frame including a pair of spaced-apart side supports;

a first member having two first ends thereof pivotably connected to said pair of side supports respectively;

a second member having two second ends pivotably connected to said first member; and

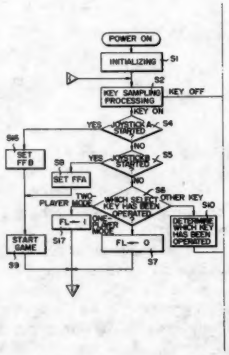
a foot plate mounted on said second member and provided with a bearing member at the center thereof, a pair of footholds, a bracket having opposite downwardly extending walls which are fastened with said foot plate, with a space left between said bracket and said foot plate, a plurality of rolling ball elements provided between said foot plate and said bracket, and a plurality of pulleys mounted inside of said downwardly extending walls to provide a foot plate which is slidably and rotatably engaged with said second member.

4,618,146

VIDEO GAME APPARATUS ALLOWING FOR A VARIATION IN PLAYING SEQUENCE

Junichi Yoshida, Tokyo, and Takashi Orimoto, Tokorozawa, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1984, Ser. No. 643,813
Claims priority, application Japan, Sep. 2, 1983, 58-161620
Int. Cl.[4] A63F *9/22*
U.S. Cl. 273—1 E **5 Claims**



1. A video game apparatus, comprising:

a main frame for receiving operating inputs;

input means including first and second joysticks each having a start key;

mode specifying means for selectively specifying either one of a first mode in which a game is played by one player and a second mode in which the game is played by two players, wherein said mode specifying means includes a RAM containing an FL register for storing a flag corresponding to the specified mode;

control means adapted to be connected to said first joystick and said second joystick, respectively, for controlling the inputs to said main frame and including a first means to control the video game apparatus in its first mode so that only an output signal from the one of said first and second joysticks whose start key is first operated is input to said main frame,

and wherein said first and second joysticks are both capable of being operated in said first mode,

and second means to control the video game apparatus in its second mode so that an output signal of the one of said first and second joysticks whose start key is first operated is input to said main frame for starting the game and, during progression of the game, output signals from said first and said second joysticks are alternately input to said main frame;

game executing means coupled to said mode specifying means and to said control means to execute the game according to the specified mode and to supply control signals to said control means; and

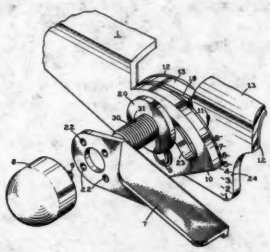
display means coupled to said game executing means to display visually the results of the executed game.

4,618,147

BOWLING GLOVE

Bruce Hurd, Ridgefield, Conn., and Robert Oda, Englewood Cliffs, N.J., assignors to AccuSwing, Incorporated, Easton, Conn.

Filed Jul. 2, 1985, Ser. No. 751,009
Int. Cl.[4] A63B *71/02*
U.S. Cl. 273—54 B **2 Claims**



1. A wrist brace for a bowler, comprising:

a rigid support body for the back of the hand provided with a layer of resilient material between said support body and said bowler's hand;

a rigid support body for the forearm provided with a layer of resilient material between said support body and said bowler's forearm;

a hinge acting between said rigid support bodies;

said hinge further comprising adjustable locking means functioning to allow said bowler to lock said brace at various angles;

said adjustable locking means further comprising a calibrated angle indicating scale;

strap means to secure said support bodies firmly but removably against said bowler's hand and forearm;

said adjustable locking means further comprising a bolt on the thumb side of said wrist brace projecting through said rigid body supports for the back of the hand and forearm, and having a locking nut projecting outward from said wrist brace;

said locking nut further comprising an adjustable lever for tightening around said bolt, wherein said locking nut further comprises at least one stud slidingly engaged into various holes in said adjustable lever functioning to allow the adjustable lever to lock together said rigid body supports for the back of the hand and forearm; and

said calibrated angle indicating scale further comprising angle indicating lines marked onto said rigid support body for the forearm cooperating with a calibrated edge of said rigid support body for the back of the hand, wherein the bowler can easily see the wrist brace angle on the locking nut side while tightening said locking nut to the desired angle by means of said adjustable lever.

4,618,148

RACQUETBALL RACQUET WITH INCREASED HITTING AREA

Raymond L. Mortvedt, Santee, and Steven M. Thompson, San Diego, both of Calif., assignors to Ektelon, San Diego, Calif.

Continuation of Ser. No. 560,538, Dec. 12, 1983, Pat. No. 4,531,738. This application Jul. 29, 1985, Ser. No. 760,337
The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.
Int. Cl.[4] A63B *49/12*
U.S. Cl. 273—73 C **5 Claims**

1. A racquetball racquet comprising a frame having a head connected to a handle grip so as to have an overall length of 19 to 22½ inches and a weight of 220 grams to 270 grams, said head having a strung surface of 75 to 100 square inches, the length of said strung surface in a direction along the longitudinal axis of the racquet being between 12 and 14¾ inches and between 53 and 68 percent of the length of the racquet, the sum total of the length of said frame plus the width of said strung surface being substantially greater than 27 inches, the center of gravity of the racquet being at a location within a range of ¾ inch toward the handle grip and ½ inch toward the head as measured from the longitudinal center point of the racquet, and the center of percussion average is spaced from the center of gravity toward the head a distance substantially greater than 3.6 inches.

4,618,149

GOLF CLUB HAVING INTERCHANGEABLE FACE PLATES

John M. Maxel, 38W580 W. Mary La., St. Charles, Ill. 60174

Filed Jun. 7, 1984, Ser. No. 618,245
Int. Cl.[4] A63B *53/08, 53/06*
U.S. Cl. 273—79 **6 Claims**

1. A wood type golf club comprising:

an elongated shaft; and

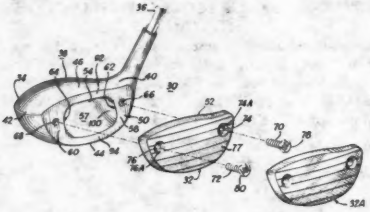
a metal club head secured to a lower end portion of said shaft,

said club head comprising an integrally molded body having a hollow interior with an opening outwardly onto a substantially planar front face; a plurality of interchangeable, ball engaging, metal face plates, each of said plates including a substantially planar back face having a surface and a peripheral edge matching the surface and the peripheral edge around said planar front face of said body; and a plurality of fasteners for securing a selected one of said face plates with its back face held tightly against said front

face of said body to close said hollow opening of said club head in readiness for use,

each of said face plates having a ball engaging, outer face spaced apart from and opposite said back face, said outer face formed with a set of characteristics including a curved bulge from toe to heel, a curved roll from bottom to top and a degree of angular loft relative to a bottom edge, and at least one of said characteristics of one face plate being different than that of another face plate to impart a different path to a ball when struck thereby,

said club head body having spaced apart top and bottom walls extending rearwardly of said front face and a curved back wall spaced rearwardly of said front face integrally joining rearward portions of said top and bottom walls,



said body further including spaced apart toe and heel portions extending rearwardly of said front face and integrally joining opposite edge portions of said top and bottom wall and having rearward portions integrally joining upstanding opposite edge portions of said rear wall,

said top and bottom walls having a minimum wall thickness adjacent said rearward portion gradually tapering toward a maximum wall thickness at said front face above and below said hollow opening, said toe and heel portions increasing substantially in thickness from said rearward portions joining said rear wall to a maximum wall thickness at said front face which is substantially thicker than said maximum wall thickness of said top and bottom wall measured at a level on said toe and heel portions that is intermediate said top and bottom walls joined therewith.

4,618,150

GAME MACHINE WITH SELECTIVE STOP MEANS FOR MOVING DISPLAY

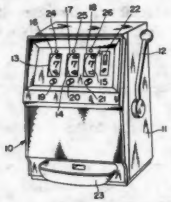
Yutaka Kimura, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Continuation of Ser. No. 485,048, Apr. 14, 1983, abandoned. This application Mar. 6, 1985, Ser. No. 709,344

Claims priority, application Japan, Apr. 14, 1982, 57-61000

Int. Cl.[4] A63B *71/04*

U.S. Cl. 273—143 R **2 Claims**



1. In a game machine having player-actuated stop means for selectively stopping a plurality of sets of visible moving symbols, each set of symbols moving through a repeating cycle, said stop means comprising a stop button individual to each said set, the improvement comprising: means for detecting the position of each of said plurality of sets of visible moving symbols; and indicating means individual to each of said plurality of sets of visible moving symbols, said indicating means being responsive to said detecting means and operating once each said cycle to indicate to a player the proper time interval for stopping each of said plurality of sets of visible moving symbols so as to correspond to a winning position thereof.

4,618,151

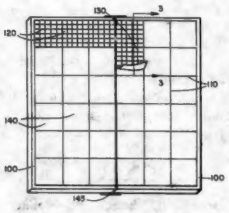
PEELABLY ADHESIVE GAME BOARD AND METHOD OF USE

Thomas A. Fadner, P. O. Box 3012, Oshkosh, Wis. 54903, and Nancy J. Linton, Apt. 3, 536 W. Division St., Villa Park, Ill. 60181

Filed May 14, 1984, Ser. No. 609,792

Int. Cl.[4] A63F *3/06*

U.S. Cl. 273—148 A **4 Claims**



1. A game board for removably holding a plurality of game cards, comprising:

a plurality of board elements, foldable together, and printed to illustrate advantageous positioning of game cards on the upper surfaces of said elements;

a polymeric coating substantially coextensively applied to the printed surface of said elements;

said polymeric coating containing materials that adhesively coact indirectly with the game cards by interaction with a coacting material applied to the reverse side of the game cards, said coating also being cooperative towards application of a release agent to its surface; and

a sheet impregnated with said release agent and inserted between said board elements when they are being folded together to be stored replenishing said release agent on the surfaces of said board elements;

said adhesively coacting materials being selected to render the game cards peelably removable together with the adhesive that was coactively created, thereby rendering the surface of said board elements substantially unchanged from their original latently coactive adhesive condition and thereby providing multiple peelable affixation and reuse cycles of game cards to said board elements.

4,618,152

HONEYCOMB SEAL STRUCTURE

James R. Campbell, South Laguna, Calif., assignor to Thomas P. Mahoney, Balboa Island; Donald A. Ruston and Robert S. Barnes, both of Newport Beach, all of, Calif., part interest to each

Filed Jan. 13, 1983, Ser. No. 457,168

Int. Cl.[4] F16J *15/40*

U.S. Cl. 277—53 **13 Claims**

1. In a seal for providing substantially cylindrical sealing surfaces, the combination of: a helically wound, sinuous strip whose alternate convolutions are vertically superimposed on one another; locating means on said convolutions for accu-

rately registering said convolutions during the successive superimposition thereof; and securement means between said

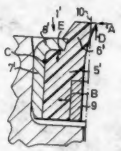
locating means to maintain said strip in a predetermined helical pattern.

4,618,153

ANNULAR REINFORCED WIPER FOR PISTON RODS

Rolf Nilsson, Eskilstuna, Sweden, Assignor to Volvo BM AB, Eskilstuna, Sweden

Filed Nov. 26, 1984, Ser. No. 675,245
Claims priority, application Sweden, Dec. 1, 1983, 8306637
Int. Cl.[4] F16J *15/32, 15/18*
U.S. Cl. 277—152 **9 Claims**



1. Annular wiper for rods intended for accommodation in a cylindrical wall opening, said opening having a cylindrical rod running therein, and comprising a reinforced ring made of an elastic, somewhat extendable material such as plastics or rubber and having a portion with an inner diameter which is slightly greater than the outer diameter of the rod, said portion being provided with a radially inwardly projecting lip with a somewhat smaller inner diameter than the outer diameter of the rod, and the reinforcement comprising a first annular portion arranged to absorb radially outwardly directed forces caused by the outwardly compressing action on the lip created by the rod, characterized in that said first portion is stiff and is disposed to serve the purpose of providing a torque centre line for the elastic ring, and in that a second annular portion is situated radially inside of said torque centre line and is arranged to absorb as a compressive force the radially inwardly directed force exerted by the elastic ring upon its turn around said torque centre line, the space between said torque centre line and the line of application of the inwardly directed force being to its greatest extent filled with the material of the elastic ring.

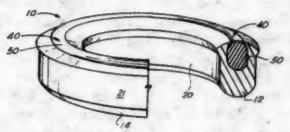
4,618,154

ANNULAR LIP TYPE SEALING RING WITH PRE-LOADED LIP PORTIONS

Merton L. Freudenthal, P.O. Box 1400, Gretna, La. 70053

Filed Jul. 31, 1985, Ser. No. 761,575
Int. Cl.[4] F16J *15/18*
U.S. Cl. 277—205 **16 Claims**

1. An annular lip type sealing ring apparatus comprising:
a. an annular body with U-shaped cross-section having a heel portion and two spaced apart lip portions that define a groove therebetween, the groove terminating at a closed end portion near the heel and at an opposite open end portion;
b. each lip portion having an outer free end with an outer arcuate curved surface;
c. at least one of the lip portions having respective inwardly and outwardly extending lateral projections;
d. the inwardly extending lateral projection including an inner curved surface;
e. means for preloading the lips with a load that biases the lips to spread apart prior to installation of the sealing ring



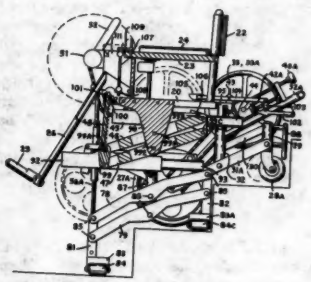
in a packing space, comprising an elastomeric annular ring having a generally round cross-section before insertion into the groove and a cross-sectional diameter greater than the width of the groove so that the elastomeric annular ring defines an interference fit with the annular body when it is placed in the groove.

4,618,155

STAIR-CLIMBING WHEELCHAIR

Laurence I. Jayne, 510 Marshall St., Davenport, Wash. 99122

Filed Nov. 13, 1985, Ser. No. 797,436
Int. Cl.[4] A61G *5/02*
U.S. Cl. 280—5.28 **15 Claims**



7. A stair-climbing wheelchair, comprising:
a chair assembly including a chair seat, a pair of elevating levers, one pair on each side of said chair, each comprising a pair of substantially horizontal, parallel lever members pinned at their midpoints to a post perpendicularly attached to said chair seat, whereby said post remains vertical and hence the chair level while the levers, in parallel, may pivot about the midpoint pins;
two pairs of linear bearings, each pair including one bearing on each side of said chair in horizontal alignment, each bearing including an outer race slide and an inner race slide, each outer race slide pinned to the ends of the elevating levers, said pairs of outer race slides on each side of the chair substantially in vertical alignment, pinned on the outer opposite sides and opposite ends of the elevating levers such that with respect to the chair center line, there is an outer first slide bearing and an inner second slide bearing whereby the outer and inner slides may be adjusted vertically with the slides always remaining substantially horizontal;
a wheel assembly including groups of wheels fore and aft with respect to said chair for supporting and transporting said chair, said wheels mounted on a frame pivotably attached to a vertical post member which is fixed to the horizontal inner slides of the first slide bearing, whereby

the wheel groups may be articulated about said pivot and locked such that the chair is supported by said wheels, some in supporting contact with one tread or surface and some in supporting contact with another tread or surface at a different elevation;

an inner feet assembly including groups of feet supporting means fore and aft with respect to said chair for supporting said chair, said feet mounted on a frame means pivotably attached to a vertical post member which is fixed to the horizontal inner slide of the second slide bearing, whereby the feet group may be articulated in the vertical direction about said pivot and locked such that the chair is supported by said feet with some feet in supporting contact with one tread or surface and some in supporting contact with another tread or surface at a different elevation;

a means for adjusting the elevation of said outer races with respect to each other, whereby the wheels and feet may be adjusted, alternatively, between a chair-supporting position and a height greater than risers of the stairs to be climbed; and

locking means for both wheel and feet assemblies which lock the assemblies into a chair-supporting position with the chair level while the wheels or feet are articulated into supporting contact with the treads or surfaces at different elevations,

whereby climbing stairs is accomplished by a series of adjusting the feet to suport the chair, adjusting the wheels in elevation at least one-half stair riser in height, which also elevates said chair one-half as much, articulating the wheels such that a wheels group closest to the stairs clears the tread, sliding the wheels toward the stairs, whereby a supporting group of wheels rests on the tread of the first stair and another supporting wheel group remains on the level surface, locking said wheels and adjusting said wheels in elevation such that all wheels are in contact with treads and surfaces to support said chair, sliding said chair seat toward said stairs over said supporting wheels by means of both said first and second slide-bearing outer slides, wherein the sequence is repeated, alternatively adjusting the feet and wheels in elevation until the stairs are climbed.

4,618,156

VEHICLE HEIGHT CONTROL SYSTEM

Hideaki Kato, Nagoya, and Kaoru Oohashi, Okazaki, both of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 26, 1984, Ser. No. 665,067
Claims priority, application Japan, Oct. 27, 1983, 58-202433
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—6 R **11 Claims**

1. A vehicle height control system comprising:

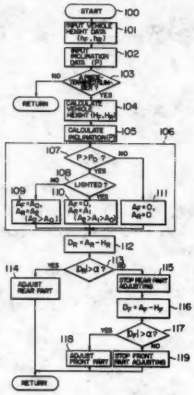
vehicle height adjust means responsive to a control signal applied thereto for adjusting respective heights of at least a front end and a rear end of a vehicle;

position signal generator means for generating actual position signals indicative of the heights of at least the front and rear ends of the vehicle;

inclination detect means for generating an inclination signal related to an inclination of a road surface on which the vehicle is running;

lighting detect means for detecting a lighting state of headlamps of the vehicle to generate a lighting signal indicative thereof;

command means for generating a first command signal which allows said vehicle height adjust means to raise the height of the rear end by a first predetermined amount relative to the height of the front end when said inclination signal indicates that the inclination of the running surface is ascending, and for generating a second command signal which allows said vehicle height adjust means to raise the height of the rear end by a second predetermined amount smaller than said first predetermined amount relative to the height of the front end when the inclination of the running surface is ascending and said lighting signal is indicating lighted lamps; and



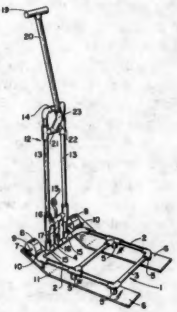
control means for applying said control signal to said vehicle height adjust means to allow said adjust means to adjust a height difference between the front end and the rear end by comparing one of said first and second command signals with said actual position signals.

4,618,157

BEACH HAND CART

Sharon H. Resnick, 3912 Lake Front Cir. #102, Virginia Beach, Va. 23452

Filed Aug. 1, 1985, Ser. No. 761,436
Int. Cl.[4] B62B *13/18*
U.S. Cl. 280—8 **9 Claims**



1. A manually operated hand cart comprising:

two or more skis;

each of said skis having a nominally smooth underside; the rear end of said underside of said ski being in a first plane; and

the front end of said underside of said ski being at an acute angle to said first plane;

one or more wheels;

each of said wheels being rotatably mounted onto said front end of said skis;

a base structure rigidly attached to the top of said skis;

said base structure having a front end and a rear end corresponding to said front end and said rear end of said skis, respectively;

a frame having a top end and a bottom end;
said frame being rotatably mounted to said front end of said base structure at said bottom end of said frame;
a handle means in communication with said top end of said frame by which handle means the hand cart may be pulled; and
locking means by which the position of said frame relative to said base structure may be temporarily fixed in the upright position.

4,618,158

ROLLER SKATES FOR FIGURE SKATING

Janusz Liberkowski, 5884 Macadam Ct., San Jose, Calif. 95123

Filed Sep. 6, 1983, Ser. No. 529,372
Int. Cl.[4] A63C *17/02*
U.S. Cl. 280—11.1 BR **12 Claims**

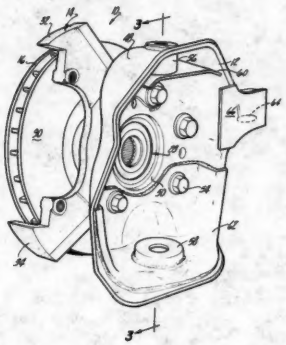
1. An improved roller skate comprising:
rigid foot plate means, said foot plate means being elongated and defining an axis;
housing means affixed to a first side of said foot plate means;
first and second carrier yoke means, said carrier yoke means each having two pair of outwardly extending generally parallel arms;
means supporting said carrier yoke from opposite ends of said housing means, said supporting means positioning said carrier yoke means so that the arms thereof extend in opposite directions and generally parallel to said foot plate means axis;
two pairs of first rollers, said rollers each having an axis of rotation and an outer surface which is convex with respect the axis of rotation;
first bearing means for rotatably supporting respective of said first rollers between the spaced arms of said pairs of arms of said carrier yoke means whereby a pair of said first rollers are supported with their axes of rotation substantially parallel from each of said carrier yoke means
a pair of second rollers, said second rollers each having an axis and an outer surface which is convex with respect to the axis of rotation thereof; and
second bearing means on each of said carrier yokes for rotatably supporting a respective one of said second rollers thereon, with the axes of rotation thereof lying substantially in respective of a pair of substantially parallel planes defined by the axes of rotation of said first rollers of each pair, said planes being substantially transverse to the axis of said foot plate means, the convex surfaces of said first rollers of each pair cooperating with the convex surface of one of said second rollers to define a skate wheel having a generally circular configuration when viewed in said planes.

4,618,159

STEERING KNUCKLE ASSEMBLY

William L. Kozyra, Rochester; Andrew B. MacIsaac, Livonia, and Vincent J. Santoro, East Detroit, all of Mich., assignors to The Budd Company, Troy, Mich.

Filed Nov. 13, 1984, Ser. No. 670,983
Int. Cl.[4] B62D *7/18*
U.S. Cl. 280—93 **30 Claims**



1. The steering knuckle assembly for a vehicle wherein said steering knuckle assembly is adapted for use with a driven wheel comprising:
a steering knuckle housing in the from of a generally concave shell, said shell having a generally flat major face and including peripheral edge flange portions extending generally transversely to the major face; and means formed in at least one of said flange portions providing a mounting location for suspension components of said vehicle;
an aperture formed in the major face of said shell through which said driven axle extends;
a bearing carrier member having a flange portion and a transversely extending internal bore, said bearing carrier member further includes a pair of integrally formed torque arms to which a brake caliper assembly can be mounted whereby said member serves as a torque plate thereof;
a hub having a radially extending flange and a generally radially extending flange portion having means therein for engaging said axle; and
bearing means mounted in said bearing carrier bore for providing rotatable engagement with said hub.

4,618,160

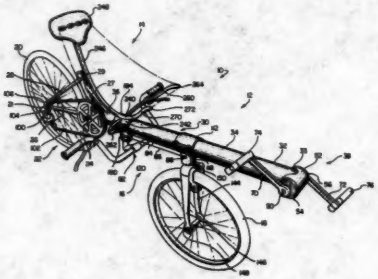
RECUMBENT VEHICLE

Lloyd McElfresh, 8706 Gross Point Rd., Skokie, Cook County, Ill. 60077

Filed Mar. 1, 1985, Ser. No. 707,453
Int. Cl.[4] B62M *1/02*; B62K *3/00*
U.S. Cl. 280—281 LP **19 Claims**

1. In a vehicle adapted to be operated by a rider in a recumbent position, including a frame having a front portion and a rear portion, a crank assembly including foot pedals supported on the front portion of the frame, a front wheel support pivotably attached to the frame intermediate the front portion and the rear portion of the frame and rotatably supporting a front wheel, a rear wheel rotatably supported by the rear portion of the frame including a rear wheel axle rigidly supporting a rear wheel sprocket, a seat supported on the frame generally intermediate the front wheel support and the rear wheel, and a steering means including a handlebar pivotably supported on the frame generally adjacent the seat and interconnected with the front wheel support, the improvement wherein said frame comprises:

an elongated tubular support means having a front portion rotatably supporting said crank assembly, a center portion supporting said seat and a rear portion rotatably supporting said rear wheel, said elongate tubular support means being adapted to substantially entirely enclose within its interior a primary drive means comprising a crank sprocket means rigidly supported by said crank assembly



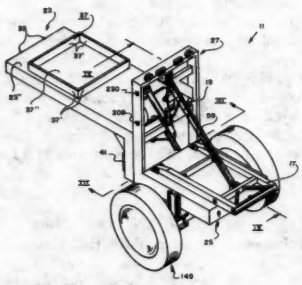
and interconnected by a power transfer means to an inner drive sprocket means rigidly supported by a drive shaft means interconnected by a secondary drive means to said rear wheel, said primary drive means providing for transfer of power supplied from rotation of said crank assembly from said crank sprocket to said inner drive sprocket and to said secondary drive means and to said rear wheel.

4,618,161

TOWING DEVICE

John M. McNeill, Memphis, Tenn., assignor to James K. McNeill, Senatobia, Miss.

Filed Jul. 12, 1985, Ser. No. 754,612
Int. Cl.[4] B60P *3/12*
U.S. Cl. 280—402 **7 Claims**



1. A fifth wheel tractor-trailer towing apparatus adapted to be connected to a towing tractor for towing a disabled tractor-trailer, said apparatus comprising:

(a) body means for being attached to the towing tractor; said body means having first and second ends and having an upwardly extending mast located between said first and second ends thereof; said mast having an upper end and a lower end;

(b) arm means for movement between one or more raised positions and a lowered position, said arm means having a first end for being pivotally attached to said body means and having a second end; said first end of said arm means being pivotally attached to said body means substantially adjacent said lower end of said mast;

(c) lifting means for moving said arm means between said raised and lowered positions, said lifting means including an elongated cable member for joining said body means and said arm means to one another in such a manner that adjustment of said cable member will cause said arm means to move between said raised and lowered positions, said lifting means including adjustment means for linearly adjusting the length of said cable member without causing said cable member to be wound up; said cable member extending between a point substantially adjacent said upper end of said mast and a point substantially adjacent said second end of said arm means; said adjustment means including piston means for engaging said cable member and movable between a contracted position in which said arm means is in said lowered position and an extended position in which said arm means is in said raised position; said piston means having a first end attached to said mast of said body means and having a second end for engaging said cable member; said adjustment means including a first sheave member attached to said arm means substantially adjacent said second end thereof, and including a second sheave member attached to said second end of said piston means; said cable member including a first end attached to said mast of said body means, including a first bight portion extending about said first sheave member, including a second bight portion extending about said second sheave member, and including a second end attached to said mast of said body means;

(d) coupling means for coupling the front of the disabled tractor-trailer to said second end of said arm means and for causing the front of the disabled tractor-trailer to be raised when said second end of said arm member is moved to said raised position; and

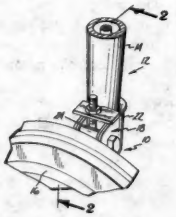
(e) wheel means for being mounted on said body means and for rollably supporting said body means.

4,618,162

DEVICE AND METHOD FOR ADJUSTING CAMBER IN A STRUT-TYPE VEHICLE SUSPENSION

John Specktor, Golden Valley, and Gerald A. Specktor, St. Paul, both of Minn., assignors to Shim-A-Line, Inc., Minneapolis, Minn.

Filed Aug. 29, 1985, Ser. No. 770,744
Int. Cl.[4] B62D *17/00*
U.S. Cl. 280—661 **12 Claims**



1. A device for adjusting camber of a wheel attached to a vehicle by a strut-type suspension having a strut member, the wheel supported by a wheel support member having first and second spaced-apart apertures, bracket means fixedly attaching the wheel support member to the strut member, the bracket means having two side portions extending on opposite sides of the wheel support member and each side portion having first and second apertures alignable with the first and second apertures of the wheel support member, respectively, and a first bolt extending through the first apertures of the wheel support member and the side portions of the bracket means, the device comprising:

a wedge member having an angularly disposed edge surface extending between a first end portion and a second end portion narrower than the first end portion, the wedge

member being positionable between the support member and the strut member;

a second bolt having a shaft portion of a substantially smaller diameter than the second apertures of the wheel support member and the side portions of the bracket means insertable through the second apertures; and

retaining and positioning means for retaining the wedge member in a fixed position between the support member and the strut member and for positioning the wedge member between the support member and the strut member to adjust camber.

4,618,163

AUTOMOTIVE CHASSIS

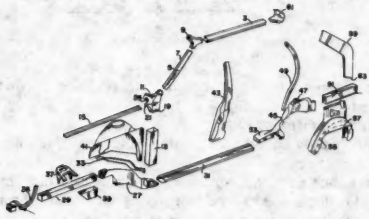
Franz Hasler, Am Hasel 3,, D-8071 Wettstetten; Ernst Mönch, Gaimersheimer Strasse 19, D-8070 Ingolstadt; Karl Reiter, Salvatorstrasse 16, D-8071 Wettstetten, and Heinrich Timm, Chemnitzerstr. 7, D-8070 Ingolstadt, all of Fed. Rep. of Germany

Filed Dec. 18, 1984, Ser. No. 682,934

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3346986

Int. Cl.[4] B62D *27/04*

U.S. Cl. 280—785 **17 Claims**



1. An automotive chassis, comprising:

a plurality of tubular members connected together to form a support structure, each tubular member comprising at least one axially extending integral portion of non-circular cross-section; and

means for connecting said tubular members by at least partially internesting engagement with said axially extending non-circular portions and comprising a plurality of means for receiving said non-circular portions and complementing the cross-section thereof for internesting therewith.

4,618,164

SEATBELT ASSEMBLY

Nobuyuki Ryu, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Mar. 29, 1985, Ser. No. 717,870

Claims priority, application Japan, Sep. 28, 1984, 59-146742[U]

Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—804 **24 Claims**

1. A seatbelt assembly for automatically fastening a restraining webbing around an occupant in a vehicle, comprising:

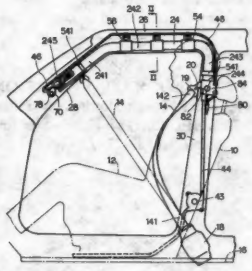
a guide rail having a first and a second end and a longitudinal guide groove running therebetween;

a slider which is displaceable along said longitudinal groove, said restraining webbing being fastened at one end thereof to said slider;

a detecting means for detecting arrival of the slider at said end of said guide rail;

a connecting wire connected to said detecting means; and

a detecting means assembly located at said first end of the guide rail for holding said connecting wire, said detecting means assembly comprising an anchor bracket for fixing said detecting means assembly to said vehicle, a first flange connected to said anchor bracket, said first flange having a C-shaped cross section, said connecting wire bending around said C-shaped cross section and a second flange which is connected to said anchor bracket at a first



end thereof, said second flange having a lateral plane which is substantially perpendicular to a longitudinal plane of said anchor bracket, said connecting wire contacting an upper surface of said second flange.

4,618,165

DEFLECTION DEVICE FOR SAFETY BELTS

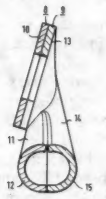
Helmut Seifert, and Karl Möndel, both of Schwäbisch Gmünd, Fed. Rep. of Germany, assignors to REPA Feinstanzwerk GmbH, Aldorf, Fed. Rep. of Germany

Division of Ser. No. 38,326, May 11, 1979, Pat. No. 4,508,286. This application Jan. 23, 1985, Ser. No. 693,730

Claims priority, application Fed. Rep. of Germany, May 12, 1978, 7814486

Int. Cl.[4] B60R *22/00*

U.S. Cl. 280—808 **3 Claims**



2. A deflection device around which a safety belt for a motor vehicle is turned, said deflection device including a first frame section having a first flat mounting portion with parallel major side surfaces, said first flat mounting portion having an opening therein, said first frame section having a first cross bar portion which is connected at its opposite ends to said first mounting portion and cooperates with said first mounting portion to define a first safety belt receiving opening, said first cross bar portion curving in a first direction from straight upper and lower edge portions and having a generally semicircular cross sectional configuration, a second frame section having a second flat mounting portion with parallel major side surfaces, said second flat mounting portion having an opening therein, said second frame section having a second cross bar portion which is connected at is opposite ends to said second mounting portion and cooperates with said second mounting portion to define a second safety belt receiving opening, said second cross bar portion curving in a second direction from straight upper and lower edge portions and having a generally semicircular cross sectional configuration, and fastener means for interconnecting said first and second frame sections with major side surfaces of said first and second mounting portions in flat abutting engagement and with the opening in the mounting

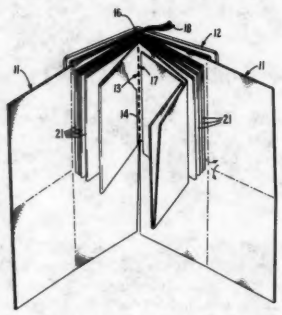
portion of said first frame section aligned with the opening in the mounting portion of said second frame section, said fastener means interconnecting said first and second frame sections with the upper and lower edge portions of the cross bar portions disposed in engagement to form a cross bar having a generally circular cross sectional configuration and with the first and second safety belt receiving openings in alignment.

4,618,166

NOTEBOOK CONSTRUCTION

Peter H. Y. Hsi, 615 Piikoi St., Suite 2001, Honolulu, Hi. 96814

Filed Sep. 20, 1984, Ser. No. 652,507
Int. Cl.[4] B42D *1/00, 9/00*
U.S. Cl. 281—15 R **7 Claims**



1. A notebook comprising:

a plurality of rectangular superposed sheets of paper with each such sheet having a central fold and having additional symmetric folds such that each sheet is folded in eighths, thus dividing each sheet into eight generally equal sections;

a cover folded in halves with each half approximately the length and width of each of said sheets when folded in eighths,

and means for securing said superposed sheets to each other and to said cover along one half of said central fold of said superposed sheets and the fold of said cover,

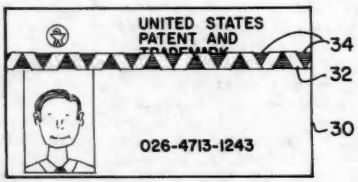
the other half of said central fold of said sheets being cut through such that each of said sheets is selectively foldable into eighths to be confined within said cover and selectively unfoldable to provide pages in even multiples of the length and width of said sheets when fully folded.

4,618,167

SECURITY FILAMENT FOR USE IN IDENTIFICATION CARDS

Edwin N. Whitehead, 6208 Tally Ho La., Alexandria, Va. 22307

Filed Feb. 9, 1984, Ser. No. 578,650
Int. Cl.[4] B42D *15/00*
U.S. Cl. 283—75 **9 Claims**



1. A security identification card, comprising

(a) an indicia bearing surface,

(b) a filament positioned on at least a portion of said surfce, said filament comprising a core of twisted unplasticized polyvinyl chloride microfilaments and metal foil spirally wrapped around said core to provide a substantially uniform spacing between the helicies of said spiral wrapping,

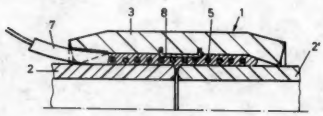
(c) a clear, transparent, polymeric cover where the heat and pressure of lamination flatten said foil, melt said core and form an integral body.

4,618,168

APPARATUS FOR THE HEAT-SEALING THERMOPLASTIC CONDUITS WITH A BRIDGING CONDUCTOR

Alfred Thalmann, Uhwiesen, and Ernesto Lehmann, Schaffhausen, both of Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Feb. 2, 1984, Ser. No. 576,333
Claims priority, application Switzerland, Feb. 4, 1983, 638/83
Int. Cl.[4] F16L *47/02*
U.S. Cl. 285—21 **14 Claims**



1. An apparatus for heat-sealing thermoplastic conduits, comprising:

a coupling element;

an electrically conductive heating element within said coupling element;

at least one bridging conductor adjacent said heating element, but spaced therefrom by insulation, said bridging conductor having a length substantially less than that of said heating element such that only a portion of said heating element is bridged by said bridging conductor upon displacement of said insulation; and

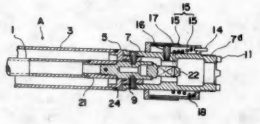
means for compressing said coupling element about the conduits.

4,618,169

CONNECTING MECHANISM FOR POLE MEMBERS

Seitaro Go, Tsuruga, Japan, assignor to Yugen Kaisha GO Chuzo Tekkosho, Fukui, Japan

Filed Dec. 16, 1982, Ser. No. 450,399
Claims priority, application Japan, Dec. 21, 1981, 56-206779
Int. Cl.[4] F16L *19/00*
U.S. Cl. 285—86 **4 Claims**



1. A connecting mechanism for pole members comprising, a pole member (A) having a male screw (7*a*) on the periphery of an end thereof and a fittingly engaging portion (11) at the end face thereof,

another pole member (B) having a fittingly engaging portion (12) at an end face thereof to engage with the fittingly engaging portion (11) of the said pole member (A) in the rotation axis thereof,

a threaded member (10) of tubular shape mounted on the said another pole member (B) to be rotatable and within a predetermined range movable in the axial direction thereof, the threaded member being provided with, on the inner wall thereof, a screw engagable with the said male screw (7*a*) of the said pole member (A) and a plurality of openings (13) at an end face thereof,

a tubular member (15) mounted on the end of the said pole member (A) to be rotatable and movable in the axial direction thereof within a predetermined range, said rotation and movement in the axial direction of the tubular member (15) being obtained by a projection (16) fixed to said pole member (A) and by a guide groove (17) formed with said tubular member (15), said tubular member being provided with at least a pin (14) engagable with the said openings (13),

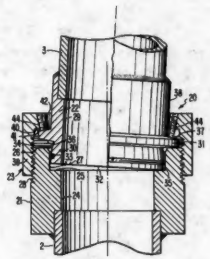
a spring (18) urging the said tubular member (15) in the direction of engagement of the pin (14) and in the direction of tightening of the threaded member (10), whereby the said pole member (A) and the said another pole member (B) are fixedly connected by selectingly engaging the pin (14) with one of the openings (13) in the state that the tubular member (15) is rotated against the urging force of the spring (18), and further wherein said guide groove (17) comprises a cam face (17*a*) formed to be capable of keeping the pin (14) in the disengaging position in which the pin is released from the opening (13) against the urging force of the spring (18) in the direction of engagement of the pin when the tubular member (15) is rotated maximally toward the returning direction of the spring (18), and a slanted cam face (17*b*) formed to be capable of producing, by contacting the projection (16), a component force (F'2) in the direction of tightening of the threaded member (10) by the urging force (F2) of the tubular member (15) in the direction of engagement of the pin (14) when the pin (14) is selectively fittingly engaged when the opening (13) in the state that the tubular member (15) is rotated against the urging force of the spring (18).

4,618,170

COUPLED PIPES AND SEALED UNIONS THEREFOR

Francis B. Fishburne, 174 Weston Rd., Arden, N.C. 28704

Filed Nov. 26, 1985, Ser. No. 801,943
Int. Cl.[4] F16J *15/00*; F16L *27/00*
U.S. Cl. 285—90 **3 Claims**



3. In a union for coupling a first tubular member to one end of a pipe when the other end of the pipe is offset from the longitudinal axis of the first tubular member, the combination of

a rigid female member having

a fluid-conducting bore,

a transverse annular outwardly projecting shoulder at the end of the bore which is opposite the first tubular member when the female member is secured thereto, and

a cylindrical sealing surface extending from said shoulder and coaxial with the bore, the sealing surface terminating at a transverse annular end face of the female member,

the body of the female member being externally threaded adjacent said end face; and

a rigid male member having

a fluid-conducting bore of substantially the same diameter as the bore of the female member,

a nose portion dimensioned to be received within the space defined by the sealing surface of the female member and having an end face capable of engagement with said shoulder of the female member,

a transverse annular outwardly projecting flange spaced from the end face of the nose portion by a distance such that, when the end face of the nose portion engages said shoulder of the female member, said flange is at least immediately adjacent to the end face of the female member,

said nose portion further including

a transverse annular outwardly opening groove,

a sealing ring seated in said groove, and

an outer surface portion extending from the groove to the flange and tapering at a small angle from a larger diameter at the groove to a smaller diameter at the flange,

the outer surface portion of the nose portion between the groove and the end face of the nose portion being of such shape and dimensions as not to come into interfering contact with the sealing surface of the female member when the male member is tilted at a predetermined small angle relative to the axis of the female member;

a nut member comprising

an internally threaded ring portion in threaded engagement with the externally threaded portion of the female member, and

a transverse annular inwardly projecting flange spaced from the end face of the female member,

the flange of the male member extending outwardly into the space between the flange of the nut member and the end face of the female member,

the inwardly projecting flange of the nut member having a plurality of threaded through bores spaced apart circumferentially of the flange and directed toward the flange of the male member; and

a plurality of screw members engaged each in a different one of the threaded bores of the flange of the nut member and having their ends in engagement with the adjacent face of the flange of the male member;

the male member being tilted relative to the longitudinal axis of the female member at an angle not exceeding said predetermined angle,

the angle of tilt of the male member and the space between the end face of the female member and the flange of the nut member being such that a first radial portion of the flange of the male member is in engagement with the end face of the female member, a second radial portion of the flange of the male member which is diametrically opposite said first radial portion is in engagement with the flange of the nut member, and a radial portion of the end face of the nose portion is in engagement with the shoulder of the female member.

4,618,171

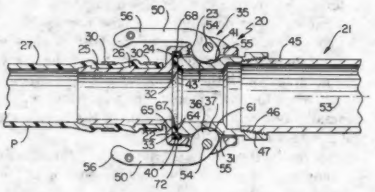
QUICK CONNECT-DISCONNECT COUPLING

Richard L. Fahl, Cincinnati, Ohio, assignor to Dover Corporation, Cincinnati, Ohio

Filed Aug. 18, 1983, Ser. No. 524,739
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—93 **20 Claims**

1. In a quick connect-disconnect coupling for fluid conduit means comprising, a coupler member adapted to be connected in said conduit means and having a first tubular outer end and a first sealing surface, an adapter member adapted to be connected in said conduit means and having a second tubular outer end and a second sealing surface, said second tubular end being

adapted to be received within said first tubular end, cam means for connecting and disconnecting said members comprising first cam means carried by said first tubular end and second cam means carried by said second tubular end, and seal means disposed between said sealing surfaces for providing a fluid-tight seal between said members with said first and second cam means connected and with said members in a first axial position thereof, said first and second cam means respectively having cam surfaces, one of said first and second cam means being movable relative to its respective tubular outer end in one direction of continuous opening movement thereof from a fully connected position of its said cam surface with said cam surface of the other of said first and second cam means with said members in said first axial position thereof to a fully disconnected position of said cam surfaces so that said members can be completely disconnected from each other, said cam surfaces of said first and second cam means acting against each other during disconnection of said members as said one cam means is being continuously moved through said opening movement thereof to provide an axial disconnecting movement of said members from said first axial position thereof until a particular



second axial position thereof is reached at which second axial position the disconnecting movement of said members is reversed and becomes an incremental axial connecting movement for a predetermined increment to a third axial position of said members before allowing said members to be completely disconnected whereby in the event fluid under pressure is present in said conduit means having said members connected therein said incremental connecting movement of said members is subjected to resistance by said fluid under pressure, said resistance being transmitted through said members as an opposing force which serves to impede said incremental movement by resisting any opening force applied to said one cam means, said opposing force being detectable and once detected serves as a warning that the pressure of said fluid under pressure must be relieved before completely disconnecting said members, the improvement wherein said seal means provides said fluid-tight seal between said members during the entire time said members are being moved from said first axial position thereof to said third axial position thereof and thereby is adapted to transmit at least part of said opposing force to said members.

4,618,172

DUAL-WALL DRILL PIPE

Floyd W. Becker, R.R. 9, Site 1, Box 15, Calgary, Alberta, Canada

Continuation of Ser. No. 461,699, Sep. 10, 1982, Pat. No. 4,565,394. This application Aug. 1, 1985, Ser. No. 761,365

Claims priority, application Canada, Feb. 24, 1982, 396949

Int. Cl.[4] F16L *21/00*

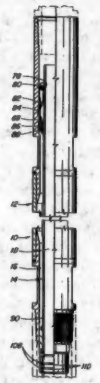
U.S. Cl. 285—141 **15 Claims**

1. A dual-wall drill pipe section for a drill string, formed from a plurality of serially connected drill pipe sections, for use in drilling in earth formations, said drill pipe section comprising, in combination:

an outer pipe member having an internally threaded box end, an externally threaded pin end, internal shoulder means extending inwardly from the bore of said outer pipe member;

an inner pipe member adapted to be concentrically disposed within and telescoping moveable inwardly and outwardly of said outer pipe member, external shoulder means extending outwardly of the outer periphery of said inner pipe member and being engageable with said internal shoulder means for axially supporting said inner pipe member, against downward movement only, in said outer pipe member when said section is in an upright position whereby axial loads applied in a downward direction to said inner pipe member are transferred to said outer pipe member;

resilient detent means associated with said inner and outer



pipe members for applying or biasing force urging said inner pipe member to a desired axial location within said outer pipe member while permitting relative axial displacement of said pipe members to move said external and internal shoulder means axially apart upon application of opposed axial forces to said members sufficient to overcome said biasing force

whereby axial loads applied in a downward direction to said outer pipe member are transmitted to said inner pipe member substantially only to the extent required to overcome said biasing force.

4,618,173

SWIVEL COUPLING ELEMENT

Emil E. Dopyera, and Jack E. Miller, both of Houston, Tex., assignors to Big-Inch Marine Systems, Inc., Houston, Tex.

Continuation of Ser. No. 271,114, Jun. 8, 1981, abandoned, which is a continuation-in-part of Ser. No. 196,527, Oct. 14, 1980, Pat. No. 4,381,871. This application Oct. 17, 1984, Ser. No. 661,875

The portion of the term of this patent subsequent to May 3, 2000, has been disclaimed.

Int. Cl.[4] F16L *27/06*

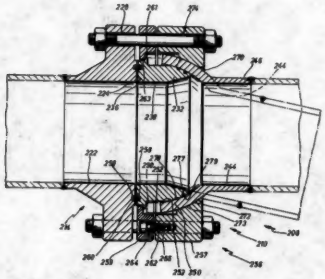
U.S. Cl. 285—261 **55 Claims**

1. A swivel coupling element adapted to be coupled to a conventional or standard annular coupling flange which has a generally planar leading end defined by a leading end of an annular flange portion and by a seating face proximate the leading end, the annular flange portion having a plurality of circumferentially spaced stud holes for use in coupling the conventional or standard annular coupling flange to another annular coupling flange, the swivel coupling element comprising:

an annular mounting flange having a trailing end, having a leading end which defines a seating face for cooperating with the seating face of such a conventional or standard annular coupling flange, and having a segmental spherical surface which is on the trailing side of the leading end of the annular mounting flange;

(b) a tubular member having a trailing end for connection to a tubular element, and having a leading end having a segmental spherical surface which is complementary to the segmental spherical surface of the mounting flange to cooperate therewith; and

(c) an annular retainer flange which has a bore through which the trailing end of the tubular member extends, the bore having a minimum diameter which is smaller than the maximum diameter of the leading end of the tubular member, the annular retainer flange being connected to the mounting flange by connection means for preventing axial separation of the two flanges and thus form the assembled swivel coupling element in which the leading end of the tubular member is held captive between the annular retainer flange and the annular mounting flange while permitting pivotal displacement of the tubular member relatively to the annular mounting flange, and which, in its



assembled condition, is adapted to be coupled to such a conventional annular coupling flange, the annular retainer flange having a plurality of circumferentially spaced stud holes which correspond with the stud holes of such a conventional or standard annular coupling flange for receiving bolts or studs for bolting the retainer flange of the assembled swivel coupling element onto such a conventional annular coupling flange to thereby generally seal the seating face of the annular mounting flange with a seating face of such a conventional annular coupling flange, and to thereby draw the annular retainer and mounting flanges towards each other into locking engagement with the leading end of the tubular member for fixing the tubular member relatively to the annular mounting flange and generally seating a portion of the segmental spherical surface of the tubular member against a portion of the segmental spherical surface of the mounting flange.

4,618,174

POWER OPERATED DOOR OPENER LOCK SYSTEM

James P. Duke, 3511 Tenaya, South Gate, Calif. 90280

Filed Dec. 19, 1983, Ser. No. 563,282

Int. Cl.[4] E05C *19/10*

U.S. Cl. 292—135 **2 Claims**

1. A system for locking a power operated door comprising:

(a) an overhead, horizontally pivoted door mounted in a door frame;

(b) a power operated door opener arm for opening and closing said door;

(c) driving means connected to said door arm;

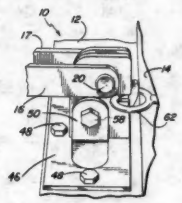
(d) power means connected to said driving means;

(e) latching means for locking said door in a closed position wherein said latching means is a self-locking latch, containing a latching dog, mounted between the header of said door and the header of said door frame and activated by said power operated door arm;

(f) a striker mounted on said door frame header adapted to engage and receive said latching dog and hold said door in a locked position;

(g) a mounting bracket to mount said latch to said door header;

(h) releasing means to disengage said latching dog;



(i) first and second latch side plates with a fixed spacer fitted therebetween, and

(j) a hook member whose thickness is less than said spacer and pivotally attached to said side plates wherein said hook member will freely move and rotate about said pivot and engage said striker by gravity force.

4,618,175

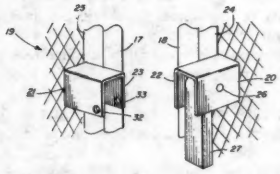
FREEZE RESISTANT GATE LATCH

Robert W. Smith, Bloomington, Ill., assignor to General Telephone of Illinois, Bloomington, Ill.

Filed Jul. 3, 1985, Ser. No. 751,639

Int. Cl.[4] E05C *3/04*

U.S. Cl. 292—205 **1 Claim**



1. A latch in combination with a first and a second gate, each of said gates having a pivot end and a free end, said latch comprised of:

(a) a pivot housing having a channel horizontally attached to the free end of said first gate, said channel having a top and two sides;

(b) a bar having a first end pivotally mounted in said pivot housing and arranged to hang vertically, and to rotate to a horizontal position; and

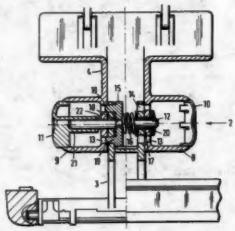
(c) a receiver housing having a channel horizontally attached to the free side of said second gate, said channel having a top and two sides;

said receiving housing arranged to be aligned with said pivot housing when said gates are in a closed position, said receiving housing for receiving part of said bar when said bar is in a horizontal position, and including means for accepting a lock or other means for holding said bar in a horizontal position.

4,618,176
WINDOW OPENER

Rolf Farmont, Düsseldorf, Fed. Rep. of Germany, assignor to ASC Auto Spezial Carosserie Vertrieb GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 6, 1983, Ser. No. 558,640
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1982, 3246396; Jun. 4, 1983, 3320343
Int. Cl.[4] E05C *17/34*
U.S. Cl. 292—263 15 Claims



1. In an opening device comprising a toggle lever joint comprising two levers which are attached at respective ends to an openable part and to a stationary part respectively and are permanently pivotally connected at other ends of the levers to each other forming a permanent single pivot, via a toggle joint having a detent mechanism and a pivot pin passing through the two levers, the detent mechanism comprising at least one detent disk mounted displaceably in an axial direction of the pivot pin and operatively disengagable from one of the levers against spring force and connected non-rotatably to the other of said levers, said detent disk having face surfaces and axially projecting detent elements distributed on one of the face surfaces, said detent elements cooperating with corresponding detent parts respectively of said one lever in respectively engaged conditions such that the openable part can be held fixed in various open positions relative to said stationary part, the improvement comprising

a grip receiving said detent mechanism and said pivot pin comprising two coaxial short grip arms which project laterally on both sides from said one lever in the axial direction of said pivot pin,

means comprising a push button for operatively disengaging said detent disk from said one lever by pushing said push button such that said detent elements disengage from said detent parts of said one lever, said push button being arranged axially displaceably in one of said grip arms for said pushing, and

said disengaging means further comprises said pivot pin, said pivot pin being axially displaceable in said grip, said pivot pin engaging at one end thereof said push button and at another portion thereof said detent disk,

said first-mentioned respective ends are freely pivotally connected to said stationary and openable parts respectively but axially immovable relative thereto,

said two levers have said detent parts forming a plurality of closed detent holes, said detent elements of said detent disk are in engagement in said engaged conditions with respective said detent holes in both of said two levers,

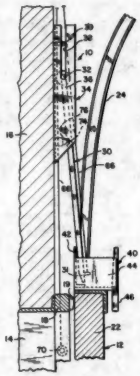
said levers are U-shaped and have U flanks on both sides of said detent disk, said detent holes are formed in said U flanks, and

said levers are axially immoveable at said toggle joint, said U-flanks of one of said levers overlying and abutting respective said U-flanks of said other lever and defining thereat coaxially aligned openings, said pivot pin extending axially displaceably but nonremovably through said aligned openings.

4,618,177
AUTOMATIC LATCHING MECHANISM FOR OVERHEAD DOORS

Robert F. Schultz, 134 Wedgewood Ave., Woodbridge, N.J. 07095

Filed Sep. 4, 1984, Ser. No. 646,524
Int. Cl.[4] E05C *17/44;* E05D *15/06*
U.S. Cl. 292—338 12 Claims



1. A latching device for overhead-type doors which are mounted for movement between a closed position and a raised position with respect to a door opening defined by a frame, said latching device comprising:

a pivotable arm having a pivot end and an engagement end;

mounting means for mounting said pivot end of said arm above the door opening for pivoting movement about a substantially horizontal axis between a first position and a second position;

said engagement end of said arm being adapted to engage a first latch portion associated with said door when said door is in said closed position and said arm is in said first position, and adapted to engage a second latch portion associated with said door when said door is in said raised position and said arm is in an intermediate position between said first and second positions, said first latch portion comprising a first latch bracket adapted to be mounted to said door adjacent an upper portion of said door; and

the arrangement of said arm relative to said door being such that said door is prevented by said arm from moving into said raised position from said closed position unless said arm is first moved toward said second position out of engagement with said first latch bracket and such that said door is prevented by said arm from moving from said raised position to said closed position unless said arm is first moved from said intermediate position toward said second position out of engagement with said second latch portion, and said first latch bracket including a counterbalanced pin member for preventing accidental pivoting movement of said arm as a result of an attempt to move said door from said closed position toward said raised position, said pin member being operative to freely permit said engagement end of said arm to move in a first direction past said pin member into said first position and operative to prevent movement of said engagement end of said arm in a second direction from said first position toward said second position.

4,618,178
HAND HELD VACUUM ACTUATED PICKUP INSTRUMENT

Clifford L. Hutson, 1860 Idlewood Rd., Glendale, Calif. 91202, and Leonidas C. Miller, Monterey Park, Calif., assignors to Clifford L. Hutson, Glendale, Calif.

Filed Jun. 7, 1985, Ser. No. 742,472
Int. Cl.⁴ B25J *15/06*
U.S. Cl. 294—64.1 **11 Claims**

1. In a hand held vacuum actuated pickup instrument, the combination comprising:

an elongated body,

means arranged at one end of the body for receiving a vacuum pickup means, tail stock means arranged at an opposite end of the body for connection with a vacuum source, and

valve means arranged within the elongated body, the valve means further comprising

(a) a tubular element forming a passage extending axially through the body for communicating the pickup means with the tail stock means,

(b) a vent opening being formed by the tubular element, the vent opening being of elongated configuration to facilitate more rapid venting of the axial passage by the valve member,

(c) a spring-loaded valve member having a valve element overlying the vent opening, an exposed lever portion attached to one end of the valve element and fulcrum means providing for pivotal movement of the valve element by the lever portion, and

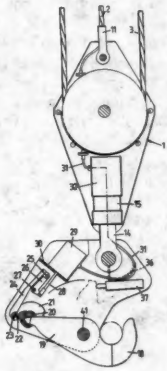
(d) means for applying the spring load on the valve member normally biasing the valve element into closed engagement with the vent opening for producing a vacuum condition in the pickup means, the valve member being operable by the lever portion for selectively exposing the vent opening and terminating the vacuum condition in the axially extending passage and in the pickup means.

4,618,179
METHOD OF UNLOADING A VESSEL BY MEANS OF A CRANE ARRANGED ON AN OFFSHORE PLATFORM AND A CRANE ADAPTED TO CARRY OUT THIS METHOD

Johannes J. Mampaeij, 98 Abeelstraat, 3329 AG Dordrecht, Netherlands

Filed Sep. 4, 1984, Ser. No. 646,528
Claims priority, application Netherlands, Feb. 14, 1984, 8400467
Int. Cl.⁴ B64D *17/38*
U.S. Cl. 294—82.31 **4 Claims**

1. In a crane for loading and unloading cargo, said crane including a cargo hook assembly comprising a block including cable pulleys rotatably carried by a pair of spaced parallel plates, a horizontally disposed bearing carried by said plates and disposed below said pulleys, a cargo hook structure including a vertically disposed shaft including means pivotally securing said shaft to said structure and extending upwardly through said bearing and affixed thereto to permit horizontal rotation of said structure, said structure further including a second pair of spaced parallel side plates, the lower portions of which are shaped to form a portion of a hook-like configuration, a hook portion pivotally mounted between the last said side plates at a point spaced inwardly from said hook-like configuration for movement about a horizontal axis from an outward load carrying position to an inward and downward load releasing position, an inwardly extending locking arm coupled to said hook portion and positioned between the last said side plates, releasable locking means between the last said side plates for holding said locking arm and hook portion in

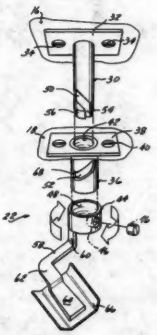


said load carrying position, and remotely controlled means carried by said assembly for releasing said locking means to permit movement of said hook portion from said load carrying position to said load releasing position.

4,618,180
LATCHING MECHANISM FOR CONVERTIBLE TOP

Peter P. Muscat, 14980 Waterfall Rd., Northville, Mich. 48167

Filed Sep. 3, 1985, Ser. No. 772,126
Int. Cl.⁴ B60J *7/185*
U.S. Cl. 296—120 A **6 Claims**



1. In an automobile convertible body having an enclosed passenger compartment including a convertible top frame with a transversely extending header member and a windshield frame including transversely extending windshield frame upper member overlain by said header member with said top frame in the raised position, adapted to be latched together, the improvement of a pair of laterally spaced latching mechanisms, each latching mechanism comprising:

an elongated post member fixedly mounted at one end to one of said top or windshield frame members:

a tubular socket fixedly mounted to the other of said top or windshield frame members, each located and adapted to slidably receive a respective post member upon raising movement of said top frame to cause said top and windshield frame members to overlie each other;

a cam ring, each slidably received over a respective socket to be rotatable thereon;

said post formed with a cam groove recessed into the surface thereof, progressing in axial and circumferential directions about the axis of said post;

said socket formed with a through slot also extending in axial and circumferential directions about the axis of said socket;

said groove and slot on said post and socket respectively having portions brought into axial alignment upon movement of said post into said socket, and each of said grooves and slots diverging axially from said aligned portions;

said post having an axially extending groove section extending from the free end of said post in circumferential alignment with said portion of said groove aligned axially with said portion of said slot;

said cam ring having a projection extending radially inward through said slot and into said groove upon movement of said post to be received within said socket;

lever means for enabling rotation of said cam ring, rotation of said cam ring of each of said pair of latching mechanism thereby moving said frame members so as to draw said top and windshield frame members together.

4,618,181

AUTOMOBILE ROOF STRUCTURE

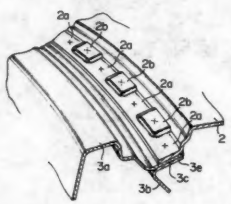
Makoto Tokuda, Hiroshima, and Takami Kimoto, Kure, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 7, 1985, Ser. No. 709,229

Claims priority, application Japan, Mar. 15, 1984, 59-37340[U]

Int. Cl.[4] B62D *27/02, 25/07;* B23K *11/10*

U.S. Cl. 296—191 **6 Claims**



1. An automobile roof structure comprising a main roof panel having opposite side edge portions, a pair of auxiliary roof panel assemblies, each of the auxiliary roof panel assemblies extending along a side edge portion of the main roof panel, each side edge portion of the main roof panel being defined by a stepped down portion to form a groove at a junction between the main roof panel and an auxiliary roof panel, each of said auxiliary roof panel assemblies including an outer panel having a laterally inner flange and a laterally outer flange and an inner panel having a laterally inner flange and a laterally outer flange, the inner and outer flanges of said outer panel being welded to the inner and outer flanges, respectively, of said inner panel to form a structure of a closed cross-section, said main roof panel stepped down portions including a plurality of projections spaced apart from each other along a length of the side edge portion, said inner flanges of the outer and inner panels of the auxiliary roof panel assembly being welded together at portions where the projections of the main roof panel are located, said projections overlying and enclosing within the groove the inner flange weld portions, said side portion of the main roof panel being welded to the inner flange of the outer panel of the auxiliary roof panel assemblies at portions between said projections of the main roof panel.

4,618,182

SUN ROOF FOR A VEHICLE

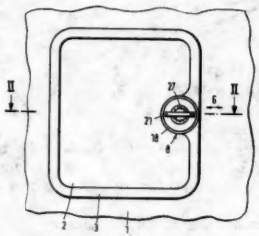
Rolf Farmont, Düsseldorf, Fed. Rep. of Germany, assignor to Farmont Produktion GmbH & Co. KG, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 8, 1985, Ser. No. 699,651

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404693; Jul. 7, 1984, 3425103

Int. Cl.[4] B60J *7/08*

U.S. Cl. 296—223 **23 Claims**



1. A sun roof for a vehicle comprising a cover plate for closing an opening in the roof, the cover plate having front and rear edges and being pivotally secured to the roof at the front edge thereof, the rear edge of the cover plate being adapted to move vertically with respect to the roof plane, and an adjusting device mounted on the vehicle roof for moving the rear edge of the cover plate, the adjusting device comprising spring means extending between the vehicle roof and the cover plate for applying a spring force to the cover plate to urge the rear edge thereof vertically upwardly, flexible pulling means acting against the spring force and having one end attached to the cover plate in the zone of the rear edge of the cover plate, drive shaft means operatively connected with the other end of the flexible pulling means for moving the other end of the flexible pulling means to provide for movement of the rear edge of the cover plate, and locking means for locking the other end of the flexible pulling means in a predetermined position to thereby retain the cover plate from movement beyond a predetermined position.

4,618,183

MULTI-PURPOSE FURNITURE PIECE

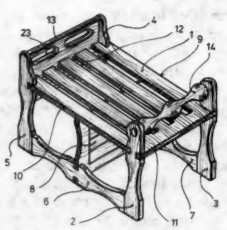
Karl-Heinz Bauer, Lerchenstrasse 9, D-8740 Bad Neustadt-/Saale, Fed. Rep. of Germany

Continuation of Ser. No. 502,669, Jun. 9, 1983. This application Dec. 30, 1985, Ser. No. 815,746

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1982, 3222497

Int. Cl.[4] A47C *13/00;* A47B *85/00*

U.S. Cl. 297—2 **9 Claims**



1. In a multi-purpose furniture piece containing a rectangular seat plane having two longitudinal sides, two transverse sides and four legs extending at right angles to said seat plane,

one of said legs being rigidly connected to each corner of said seat plane, at the intersection of a longitudinal side and a transverse side of said seat plane, the improvement which comprises:

(a) two longitudinal rungs, each of said rungs having its outer ends affixed to the free ends of two legs located on the same longitudinal side of said seat plane;

(b) a wall rigidly connected to said seat plane and to said rungs and extending parallel to said first and second transverse sides and vertically to said seat plane, said wall being located at a substantially equal distance from each of said transverse sides, said wall being adapted to serve as a first stepping surface when said furniture piece is oriented in a stepladder position, with two of said legs at an end of said seat plane are substantially horizontal and adjacent a floor surface; and

(c) an end plane located at and affixed to one of the transverse sides of said seat plane, said end plane having a smaller dimension parallel to said legs then the length of said legs, said end plane being adapted to serve as a second stepping surface at a height above said first stepping surface when said furniture piece is oriented in said stepladder position.

4,618,184

FOLDABLE CHAIR FRAME

Samuel E. Harvey, Coventry, England, assignor to Andrews Maclaren Limited, Northampton, England

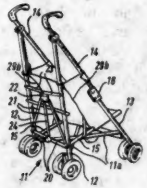
PCT No. PCT/GB83/00233, § 371 Date May 11, 1984, § 102(e) Date May 11, 1984, PCT Pub. No. WO84/01133, PCT Pub. Date Mar. 29, 1984

PCT Filed Sep. 21, 1983, Ser. No. 611,007

Claims priority, application United Kingdom, Sep. 23, 1982, 8227214

Int. Cl.⁴ B62B *7/14*

U.S. Cl. 297—19 **4 Claims**



1. A flexible chair frame, comprising: two back members and two upper brace members, each back member being connected to a corresponding upper brace member at a junction; a seat back movable between an upright position attached to the upper brace members and a lie-back position attached to the back members; and support means for facilitating movement of the seat back into and out of its upright and lie-back positions, the support means comprising two links respectively pivoted at their upper ends to the junctions between the two back members and the two upper brace members and at their lower ends, formed with resiliently deformable hooks which are permanently engageable with the seat back and releasably engageable with the back members and with the upper brace members so that the support means is releasably engageable with the upper brace members and back members of the frame when the seat back is in its upright and lie-back positions, respectively.

4,618,185

ERGONOMIC CHAIR

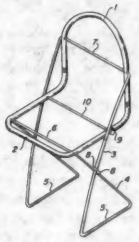
Yaacov Kaufman, 17 Alexander Yanai, Tel-Aviv, Israel

Filed Sep. 18, 1985, Ser. No. 777,263

Claims priority, application Israel, Sep. 19, 1984, 73031

Int. Cl.⁴ A47C *3/00*

U.S. Cl. 297—285 **10 Claims**



1. An ergonomic chair characterized in that it comprises:

a substantially rigid seat structure (2,2'),

a substantially rigid back structure (1,1'), articulated to the seat structure,

a base (5,5') resting on the floor,

a legs structure comprising on each side a pair of crossing legs (3,3',4,4'), one (4,4') of which is articulated at the upper end to the front portion of the seat structure (2,2'), is provided with a slider (8,8') for the other leg (3,3') and is bound at the lower end to the base (5,5'), whereas the other leg (3,3'), which is elastically bending deformable, is articulated at the upper end to the back structure (1,1'), leans against a back stud (9,9') applied to the seat structure (2,2'), engages with the slider (8,8') foreseen in the other leg (4,4') and is bound at the lower end to the base (5,5').

4,618,186

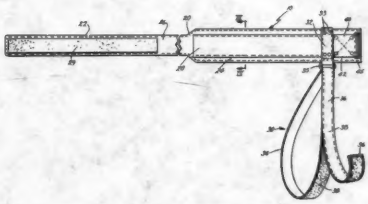
CHILD SAFETY RESTRAINT

Alfred B. Swanson, 2945 Bonnell SE., Grand Rapids, Mich. 49506

Filed Jan. 16, 1985, Ser. No. 691,840

Int. Cl.⁴ A47D *15/00*

U.S. Cl. 297—468 **1 Claim**



1. An adjustable child restraint, comprising:

a waistband having a wide portion of substantial width merging at one end into an elongated narrow portion of reduced width, said waistband being formed from two pieces of material laid one on top of the other and seamed together along the edges thereof;

an anchor strap attached to said wide portion of said waistband adjacent to a free end thereof;

a first D-ring secured to said anchor strap for receiving said narrow portion of said waistband after said wide portion is wrapped around a child's waist;

a first hook means and a first napped loop means attached to the outer surface of said waistband wherein said first hook

means is attached to the outer surface of one of said narrow and wide portions and said first napped loop means is attached to the outer surface of the other of said narrow and wide portions, whereby said waistband, after being wrapped around a child's waist, may be secured in place by threading said narrow portion through said first D-ring and doubling back said narrow portion over said wide portion so that said first hook and said first loop means on said portions can be engaged;

an elongated securing strap for looping around an anchoring object, said securing strap having an attached end, an attached portion, a free portion and a free end, wherein said attached end is attached to one surface of said wide portion near a lateral edge thereof adjacent said first D-ring; said attached portion extending across the outer surface of said wide portion and being doubled back through a second D-ring adjacent the opposite lateral edge of said wide portion, and then passed back over itself and folded over the first lateral edge and then across the opposite face of said wide portion;

said second ring being adapted to receive said free end of said strap after said free portion of said strap has been looped around an anchor object; and

a second hook means and a second napped loop means wherein said second hook means is attached to and extends along approximately half the length of said free portion of said securing strap and said second napped looped means is attached to and extends along the other half of the length of said free portion, whereby said securing strap is secured after being looped around an anchor object and passed behind and through said second D-ring by engagement with said second hook means on the one half of said free portion with said second napped loop means on the other half of said free portion.

4,618,187

WIRE WHEEL

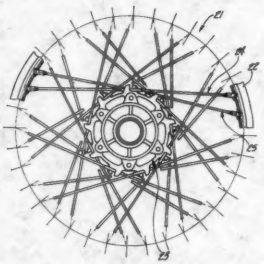
Masae Watanabe, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation-in-part of Ser. No. 571,912, Jan. 18, 1984, abandoned. This application Apr. 13, 1984, Ser. No. 600,130

Claims priority, application Japan, Apr. 15, 1983, 58-65712; Apr. 15, 1983, 58-65713; Apr. 15, 1983, 58-65714; Apr. 15, 1983, 58-65715; Apr. 15, 1983, 58-65716; Apr. 15, 1983, 58-65717; Apr. 15, 1983, 58-65718; Apr. 30, 1983, 58-76974

Int. Cl.[4] B60B *1/04*

U.S. Cl. 301—56 **6 Claims**



1. A wire wheel having a hub portion, a rim portion, and a plurality of spokes interconnecting said hub and said rim portions, said spokes being arranged in pairs comprising a first end portion fixed at its outer end to said rim portion and a second end portion fixed at its outer end to said rim portion, an intermediate portion integrally connecting the inner ends of said end portions and lying at an angle to said end portions and affixed to said hub portion, the improvement comprising said intermediate spoke portion being connected to said spoke end portions by respective curved parts, said end portions each being disposed at an angular relation to the intermediate portion with the angle between each end portion and the intermediate portion being different from the other, the angle encompassed by said end portions being less than 180°, said hub portion having an opening receiving said spoke intermediate portion for affixing said spokes to said hub portion, said opening being formed with a diameter larger than the diameter of the spoke intermediate portion and being curved on its opposite faces at the same radius as the corresponding curved parts of the intermediate portion.

4,618,188

HYDRAULIC ANTI-SKID APPARATUS FOR AUTOMOTIVE VEHICLES

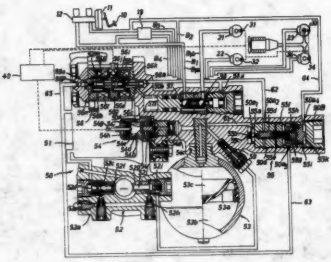
Takumi Nishimura, Chiryu, and Tadao Saito, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Aug. 13, 1985, Ser. No. 765,124

Claims priority, application Japan, Aug. 13, 1984, 59-169073

Int. Cl.[4] B60T *8/10*

U.S. Cl. 303—116 **8 Claims**



1. A hydraulic anti-skid apparatus for installation in a vehicle braking system between a master cylinder and a wheel brake cylinder, comprising:

a main body formed therein with a single cylinder the one end of which is closed by a closure member fixed thereto, said cylinder being provided with an inlet port for connection to said master cylinder and an outlet port for connection to said wheel brake cylinder;

a cut-off valve including a valve seat arranged within said cylinder to permit the flow of fluid between said inlet and outlet ports therethrough, and a valve element arranged to cooperate with said valve seat to block the flow of fluid from said inlet port to said outlet port when engaged with said valve seat;

a first piston axially slidably disposed within one end portion of said cylinder to be applied at one end thereof with a braking pressure from said master cylinder through said valve seat and at the other end thereof with a hydraulic power pressure from a power pressure source, said first piston being associated with said valve element to disengage said valve element from said valve seat while the hydraulic power pressure is applied thereto and to be displaced outwardly by the braking pressure when released from the hydraulic power pressure to effect engagement of said valve element with said valve seat and subsequently to increase a capacity downstream of said valve seat;

a bypass valve including first and second valve seats arranged within said cylinder coaxially with the valve seat of said cut-off valve and axially spaced to each other to form a valve chamber in open communication with said outlet port, said first valve seat forming a bypass passage between said inlet and outlet ports, and said second valve seat being in communication with the valve seat of said cut-off valve to permit therethrough the flow of fluid from the valve seat of said cut-off valve to said valve

chamber, a second valve element contained within said valve chamber to permit the flow of fluid passing through said second valve seat when engaged with said first valve seat and to permit the flow of fluid passing through said bypass passage when engaged with said second valve seat, and a spring interposed between said valve element of said cut-off valve and said second valve element; and

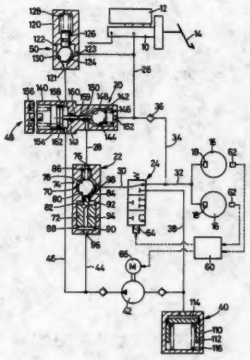
a second piston axially slidably disposed within the other end portion of said cylinder to be applied at one end thereof with the braking pressure and at the other end thereof with the hydraulic power pressure, said second piston being associated with said second valve element to maintain engagement of said second valve element with said first valve seat against said spring while the hydraulic power pressure is applied thereto and to effect engagement of said second valve element with said second valve seat when released from the hydraulic power pressure.

4,618,189

VEHICLE HYDRAULIC BRAKING SYSTEM WITH ANTI-SKID PRESSURE CONTROL MEANS

Nobuyasu Nakanishi, and Yoshihisa Nomura, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 9, 1985, Ser. No. 764,226
Claims priority, application Japan, Aug. 15, 1984, 59-170724
Int. Cl.[4] B60T *8/08*
U.S. Cl. 303—116 **7 Claims**



1. A hydraulic braking system with anti-skid pressure control means for applying a brake to a drive wheel of an automotive vehicle, having (a) a master cylinder for generating a fluid pressure in response to an operation of a manually-operated member, (b) a brake having a brake cylinder actuated by the fluid pressure generated by the master cylinder, for restraining the rotation of a drive wheel of the vehicle, (c) a primary fluid passage connecting the master cylinder and the brake cylinder to feed a brake fluid from the master cylinder to the brake cylinder, (d) a solenoid valve disposed in the primary fluid passage and selectively placed in one of a first operating position for communication of the brake cylinder with the master cylinder, and a second operating position for communication of the brake cylinder with a reservoir, the solenoid valve being switched between the first and second operating positions under the control of a controller, to control a level of a braking pressure in the brake cylinder for preventing an excessive amount of slip of the drive wheel, (e) a pump for pumping the brake fluid from the reservoir and returning the pumped fluid via a pump passage to the primary fluid passage at a point thereof between the master cylinder and the solenoid valve, (f) a shut-off valve disposed in a portion of the primary fluid passage between the master cylinder and said point, the shut-off valve being closed to prevent a flow of the brake fluid therethrough in a direction from the pump toward the master cylinder when the pressure on one side of the shut-off valve on the side of the pump is higher than that on the other side on the side of the master cylinder, and (g) an accumulator disposed in a fluid passage connecting the pump and the solenoid valve, the accumulator having an accumulator housing, an accumulator piston slidably received in the accumulator housing, and biasing means for biasing the accumulator piston in one axial direction thereof, the accumulator piston cooperating with the accumulator housing to define a storage chamber of a variable volume in which the brake fluid is stored under a relatively high pressure, wherein the improvement comprises:

a check valve disposed in a portion of said primary fluid passage between said master cylinder and said shut-off valve, and adjacent to said accumulator, said check valve inhibiting a flow of the brake fluid therethrough in a first direction from said master cylinder toward said shut-off valve and allowing a flow of the brake fluid therethrough in a second direction opposite to said first direction, said check valve including a check valve seat and a check valve member adapted to be seated on said check valve seat; and

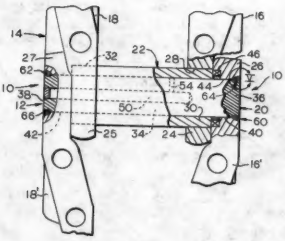
a valve-control mechanism disposed between said accumulator and said check valve for controlling said check valve, said valve-control mechanism holding said check valve member away from said check valve seat to allow the brake fluid to flow in said first direction while said accumulator piston is placed in its fully advanced position in which the volume of said storage chamber is minimum, said valve-control mechanism permitting said check valve member to be seated on said check valve seat after said accumulator piston has been retracted a small distance away from the fully advanced position.

4,618,190

TRACK JOINT RETAINING APPARATUS

James A. Garman, Eureka, Ill.; Stephen D. Swift, Yacolt, Wash.; Richard E. Livesay, Peoria, and Arlyn J. Arians, Washburn, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation-in-part of Ser. No. 476,909, Mar. 18, 1983, abandoned. This application May 16, 1985, Ser. No. 734,526
Int. Cl.[4] B62D *55/20*
U.S. Cl. 305—39 **40 Claims**



1. Apparatus for retaining a track joint, said track joint having a pin and a pair of links, each link having a bore and said pin having first and second end portions each mounted within a respective one of said link bores, comprising:

each of said pin end portions having a groove extending around at least a portion of the circumference of its end portion, each groove having a surface facing in a generally axially inward direction;

each bore of said links having an outwardly opening socket, each socket having a surface facing in a generally axially outward direction, said sockets and respective grooves being in registry with one another and cooperatively defining a respective one of a pair of retainer cavities; and

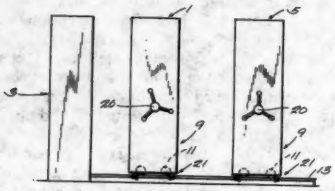
a formed-in-place retainer disposed and formed within and

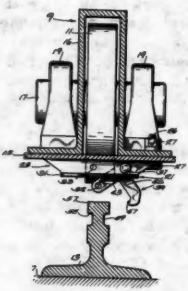
substantially conforming to the shape of each of said retainer cavities, each retainer having a shear strength sufficient to maintain its respective link against outward axial movement on said pin during operation of said track joint.

4,618,191
ANTI-TIP DEVICE

Robert J. Peterman, Hartland, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.

Filed Jan. 25, 1985, Ser. No. 694,847
Int. Cl.[4] B61F 9/00; A47B 53/00
U.S. Cl. 312—201 **11 Claims**





3. In a mobile storage system having a carriage and a plurality of wheels mounted thereon for rolling the carriage longitudinally along a fixed path, at least one anti-tip device for preventing tipping of the carriage comprising:

a. a plurality of rails for supporting the carriage wheels, each rail defining a longitudinal groove having an undercut surface;

b. bracket means for mounting to the carriage and defining an aperture therethrough having a longitudinal axis parallel to the direction of carriage motion;

c. an anti-tip arm pivotally mounted to the bracket means for pivoting in a plane transverse to the direction of carriage motion along the rails, the anti-tip arm being formed with a first extension defining an aperture therethrough alignable with the aperture in the bracket means and a second extension defining a hook adapted to slide within the rail groove proximate the rail undercut surface when the arm and bracket means apertures are aligned; and

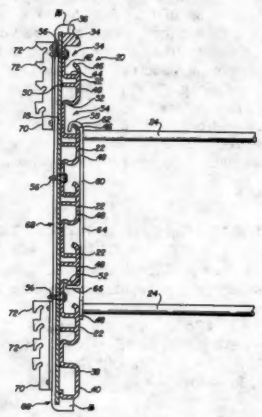
d. a locking pin selectively insertable through the aligned apertures in the bracket means and arm first extension to thereby render the anti-tip arm operative by preventing the arm from pivoting about the bracket means and removable from the arm and bracket means apertures to thereby render the anti-tip arm inoperative by permitting the arm to pivot relative to the bracket means,

so that when the anti-tip arm is in the operative mode a force tending to tip the carriage is resisted by the arm hook bearing against the rail undercut surface.

4,618,192
CABINET WITH HANGER RAILS

James O. Kelley, Spring Lake, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Mar. 14, 1985, Ser. No. 711,975
Int. Cl.[4] A47B 67/02
U.S. Cl. 312—245 **14 Claims**



1. In a wall-mountable cabinet, the combination of a top wall, a bottom wall, two side walls and a back wall; at least one mounting bracket secured to the cabinet and having a plurality of rearwardly-projecting and downwardly-depending tabs adapted to engage slotted vertical standards mounted to the wall; and

a rail means secured to said back wall, comprising a plurality of vertically spaced, horizontal hanger rails spanning substantially the width and height of said back wall and for removably hanging work accessories;

whereby said work accessories can be hung at a variety of horizontal and vertical positions on said hanger rails and within said cabinet.

4,618,193
CABINET CONSTRUCTION FOR AN AUTOMATIC WASHER

Victor W. Cuthbert, and Joel M. Snider, both of Lincoln Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 7, 1983, Ser. No. 558,875
Int. Cl.[4] A47B 47/03
U.S. Cl. 312—264 **12 Claims**

11. A cubical cabinet for a domestic appliance, comprising:

three side panels,

cooperating slot and tab means between a first of said panels and a second, adjacent panel to restrain said second panel from lateral and longitudinal movement only when said second panel is approximately perpendicular to said first panel,

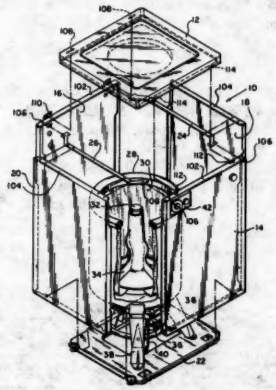
cooperating slot and tab means between said first panel and a third adjacent panel which is opposite and parallel to said second panel to restrain said third panel from lateral and longitudinal movement only when said third panel is approximately perpendicular to said first panel,

said second and third panels each having a free end opposite said first panel,

restraining means selectively securable to said free end of said second and third panels to secure said second and third panels in fixed relationship,

a fourth panel adjacent and perpendicular to said second and

third panels and opposite and parallel to said first panel, and



a latch means and cooperating slot and tab means between said fourth panel and said second and third panels to restrain said fourth panel from lateral and longitudinal movement.

4,618,194

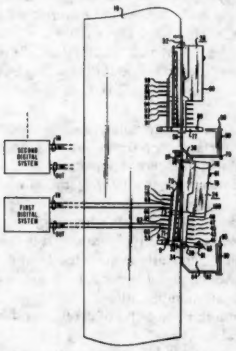
CONNECTING BLOCK FOR DIGITAL SYSTEM CROSS-CONNECT FRAME

Jerald J. Kwilos, Ironia, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 15, 1985, Ser. No. 755,152

Int. Cl.[4] H04Q *1/14;* **H01R** *9/09, 25/00*

U.S. Cl. 339—14 R **11 Claims**



1. Apparatus for interconnecting first and second digital systems, said apparatus being housed in a frame comprising upper and lower crossarms, said apparatus comprising

a backplane having front and rear surfaces and housing a plurality of first terminals extending outwardly from said rear surface for terminating a plurality of circuits to and from said first and second digital systems,

a housing unit connected mechanically and electrically to said backplane said housing unit having a plurality of second terminals for interconnecting said first and second digital systems, said housing unit having front and rear surfaces, said second terminals extending forwardly from said front surface of said housing unit,

a resilient tang on the upper surface of said apparatus and adapted to be snapped removably into place in said upper crossarm within said frame for retaining said apparatus,

a pedestal comprising anterior and posterior projections and a central recess in an upper surface of said pedestal facing a lower end of said housing unit to mate with said housing unit, said pedestal further comprising a longitudinal recess in a lower surface of said pedestal adapted to mate with said lower crossarm of said frame for retaining said apparatus, and

a plurality of printed wiring boards within said apparatus for establishing an electrical path between said first terminals of said backplane and said second terminals on said front surface of said housing unit.

4,618,195

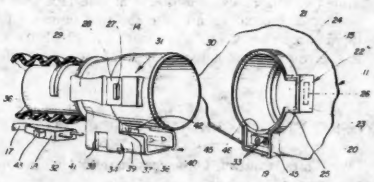
VACUUM CLEANER HOSE COUPLING

James W. Keane, Ramsey County, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 3, 1985, Ser. No. 740,623

Int. Cl.[4] H01R *13/73*

U.S. Cl. 339—16 R **18 Claims**



1. Structure for concurrently connecting an end of a vacuum cleaner hose to a suction inlet of a canister, and an electrical power cord carried exteriorly of the hose and having at one end a first electrical connector associated with the hose end to a complementary second electrical connector associated with the canister, the connecting structure comprising:

locking means formed integrally with said hose end for releasably locking said hose end to said suction inlet to provide an air flow communication therebetween; and

means formed integrally with said hose end for removably mounting said first electrical connector to said hose end to be accurately aligned and engaged with said second electrical connector as an incident of locking association of said locking means to said suction inlet.

4,618,196

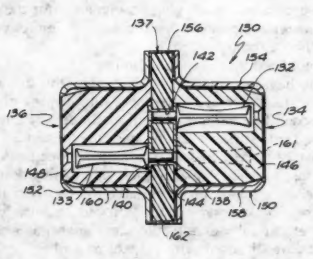
GENDER REVERSAL CONNECTOR

Steven Z. Muzslay, Huntington Beach, Calif., assignor to ITT Corporation, New York, N.Y.

Filed May 30, 1985, Ser. No. 739,398

Int. Cl.[4] H01R *31/06*

U.S. Cl. 339—17 C **6 Claims**



1. A gender reversal connector comprising:

a plate of insulative material having first and second opposite faces, top and bottom edges, and opposite sides;

first and second rows of holes in said plate, each row of holes extending parallel to said edges with said first row closer to the top edge and the second row closer to the bottom edge, each hole being plated with conductive material;

a plurality of conductive traces, each connecting a hole in said first row to a hole in said second row;

a plurality of elongated contacts, each including an inner end lying in one of said holes and an outer end projecting away from a face of said plate, said contacts of each pair having inner ends lying in different holes whose platings are connected by a trace and with each contact of a pair extending away from a different face of the plate;

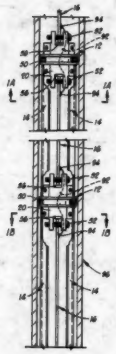
most of the contacts whose inner ends lie in a first row of holes positioned so every other contact extends from said first face of said plate and the contacts inbetween extend from said second face of said plate, and most of the contacts whose inner ends lie in said second row of holes are positioned so every other contact extends from said second face of said plate and the contacts inbetween extend from said first face of said plate, said contacts being so arranged that a first connector can be electrically joined to the rows of contacts at one face and another connector basically similar to the first connector but rotated substantially 180° thereto can be electrically joined to the rows of contacts at the other face.

4,618,197

EXOSKELETAL PACKAGING SCHEME FOR CIRCUIT BOARDS

Billy W. White, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 19, 1985, Ser. No. 747,077
Int. Cl.[4] H05K *7/00*
U.S. Cl. 339—17 R **8 Claims**



1. An exoskeletal packaging arrangement for the disposition of instrument components in a tubular housing for deployment in a well bore, comprising:

two bulkhead means each including a truncated cylindrical body having a longitudinal bore therethrough and having on at least one end thereof a plurality of diametrically opposed flat surfaces laterally bounded by angularly disposed side surfaces having apertures therein;

at least two shell plates extending between said bulkhead means, said shell plates each comprising longitudinally extending major portions laterally bounded by substantially co-extensive edge portions angularly disposed thereto at substantially the same angles as said side surfaces are disposed with respect to said flat surfaces, said shell plates having apertures therethrough at each end thereof aligned with said side surface apertures, said bulkhead means further including fasteners extending through said shell plate apertures and into said side surface apertures; and

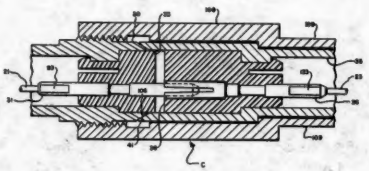
longitudinally extending board means having tab means at each end thereof supported by said bulkhead means.

4,618,198

CONNECTOR FOR SEALINGLY JOINING THE ENDS OF A PAIR OF ELECTRICAL CABLES

Steven M. Dale, Williamsville; Richard A. Lyon, Buffalo, and David P. Schutram, West Seneca, all of N.Y., assignors to Conax Buffalo Corporation, Buffalo, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,576
Int. Cl.[4] H01R *13/506, 13/52*
U.S. Cl. 339—60 M **6 Claims**



1. A connector for sealingly joining the ends of a pair of electrical cables, each of said cables having at least one insulated conductor, comprising:

(a) a tubular metal male housing having inner and outer ends and encircling a marginal end portion of one of said cables,

(b) an externally-tapered surface on said inner end of said male housing,

(c) a tubular metal female housing having inner and outer ends and encircling a marginal end portion of the other of said cables,

(d) an internally-tapered surface on said inner end of said female housing and adapted to be contacted by said externally-tapered surface, the taper of said externally tapered surface being at a steeper angle than the taper of said internally tapered surface, and the quality of finish of such tapered surface having an RMS rating number no higher than 32,

(e) means arranged to draw said housings together and force said tapered surfaces into firm contact to provide a sealing metal-to-metal joint therebetween,

(f) a contact pin member insulatively mounted in one of said housings and electrically connected to the conductor in the cable associated with such housing,

(g) a socket member insulatively mounted in the other of said housings and electrically connected to the conductor in the cable associated with such housing and adapted to receive said pin member, and

(h) means sealing the outer end of each of said housings to its associated cables,

thereby to form a sealed chamber within said joined housings within which electrical contact may be made.

4,618,199

LOW INSERTION FORCE SOCKET

Wayne K. Pfaff, 1316 Savannah, Irving, Tex. 75062

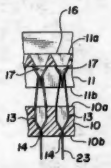
Filed Aug. 30, 1985, Ser. No. 771,104
Int. Cl.[4] H01R *13/635*
U.S. Cl. 339—74 R **10 Claims**

1. A receptacle for a device package having a plurality of pins extending substantially parallel with each other in a first direction from said package comprising:

(a) a plurality of substantially U-shaped pin connectors constructed of resilient electrically conductive material, each of said pin connectors having two opposed sides extending

in a first general direction from the base of the U and a contact pin extending in substantially the opposite direction from the base of the U with the sides of the U converging toward each other near the ends thereof remote from the base of the U and at least the end of one side of each U-shaped pin connector diverging outwardly from the opposite side of the U-shaped pin connector to define a contact knee inward from the end of the pin connector remote from the base of the U;

(b) a substantially electrically insulating base member with first and second oppositely disposed major faces and a plurality of cavities in said first major face adapted to receive the bases of said U-shaped pin connectors and with apertures for receiving the contact pins so that the contact pins extend from said second major face of said base member; and



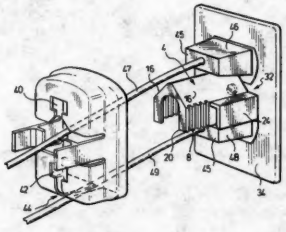
(c) a top plate member with first and second oppositely disposed major faces mounted with its second major face substantially parallel with and spaced from the first major face of said base member, said second major face of said top plate member having at least one cavity therein adapted to receive the ends of said sides of at least one pin connector, an aperture passing through said top plate member aligned and in register with said ends of said at least one pin connector, and wedge means disposed on at least one side of said cavity and arranged for insertion between the two opposed sides of said at least one pin connector to spread the sides of said at least one pin connector apart at the ends thereof remote from the base when said top plate member is moved toward said base member.

4,618,200

ELECTRICAL PLUG RESTRAINT SYSTEM

David Roberts, 36 Dixon Avenue, Toronto, Ontario, Canada M4L 1N3, and Clyde Hillier, 324 Connington, London, Ontario, Canada N6C 4C9

Filed Feb. 22, 1985, Ser. No. 705,113
Int. Cl.[4] H01R *13/631*
U.S. Cl. 339—75 P **11 Claims**



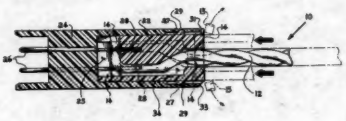
1. An electrical outlet accessory for restricting removal of electrical plugs from electrical receptacles comprising a securing post adapted for securement to a duplex receptacle, and a cover releasably securable to said securing post, said cover including access means therein to allow selective placement of up to two electrical plugs essentially within said cover with the associated electrical cord thereof passing through electrical cord ports in the cover, said cover being selectively engageable with said post at various positions to accomodate electrical plugs of different configuration and selectively disengageable from said post to allow plug removal from an insertion into such receptacle and wherein said securing post includes a projection to the rear face thereof for insertion in one of the ground connectors of such duplex receptacle.

4,618,201

CONNECTOR FOR ESTABLISHING ELECTRICAL CONTACT WITH A HIGH COUNT TWISTED PAIR CABLE

Peter K. Townsend, Camp Hill, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 16, 1984, Ser. No. 631,383
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—99 R **1 Claim**



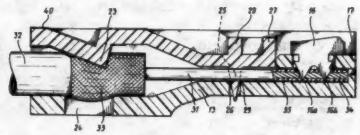
1. A connector for establishing electrical contact with the conductors of a twisted pair cable comprising a receptable having a cavity with an opening into which a wiring block telescopes, said receptacle having a plurality of conductive insulation piercing devices fixed thereto extending into said cavity, said receptacle having a trailing edge formed into a plurality of scalloped cutting edges, said writing block having a leading edge, said conductor being inserted into said wiring block and extending above said leading edge, said leading edge of said wiring block intersecting with said scalloped edges to form a shearing edge as said wiring block is inserted into said cavity whereby the portion of said conductors above said leading edge are sheared off outside said connector.

4,618,202

CONNECTOR WITH STRAIN RELIEF

Hubertus B. Libregts, Vlijmen, and Cornelis G. J. van Nes, Oisterwijk, both of Netherlands, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 20, 1985, Ser. No. 778,246
Claims priority, application Netherlands, Sep. 27, 1984, 8402949
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—99 R **6 Claims**



1. A connector intended for attachment to the end of a cable having one or more insulated conductors enclosed by a jacket, said connector comprising:

two housing parts which, when assembled, define a passage having a first section adapted to accept the end portion of the cable jacket and a second section adapted to accept the insulated conductors projecting from the jacket,

each housing part being provided at the first section of the passage with strain relief means intended to act on the cable jacket,

one of said housing parts being provided at the second sec-

tion of the passage with a pierce contact for each conductor, each said pierce contact being movable from a first position in which the insulated conductors can be introduced unimpeded into the second section of the passage to a second position in which each conductor is at least partially pierced by its respective pierce contact,

another of said housing parts being provided at the second section of the passage with cone-shaped teeth which, when the housing parts are assembled, project from the wall of the passage defined by said other housing part into the passage at right angles to the conductors and extend to the wall of the passage defined by said one housing part,

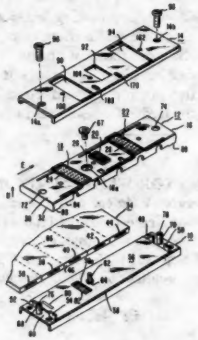
said projecting teeth defining apertures in the passage which are smaller than cross-sectional area of the insulated conductors so that the teeth grip the insulation surrounding the conductors, thereby providing strain relief for each insulated conductor.

4,618,203

ISOLATED GROUND DEVICE FOR FLAT UNDERCARPET CABLE

William S. Greenwood, Nutley, and Karl Weinmann, Watchung, both of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Apr. 8, 1985, Ser. No. 720,648
Int. Cl.[4] H01R *11/20*
U.S. Cl. 339—99 R **22 Claims**



1. An adapter for electrical connection to a flat multiconductor cable having a neutral conductor, a ground conductor, an isolated ground conductor and at least one live conductor, comprising:

an insulative housing having a first surface and an opposite second surface, said second surface adapted to be placed in juxtaposition with said cable;

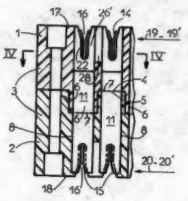
three electrical contacts in said housing, one contact for said neutral conductor, one contact for said isolated ground conductor and one contact for one live conductor, each contact having a terminal portion for connection thereto, said terminal portions being disposed at said first surface of said housing, said contacts each having an insulation displacement portion disposed at the second surface of said housing for registry and connection respectively with said neutral conductor, said isolated ground conductor and one live conductor, said insulation displacement portion of said contact for said isolated ground conductor being removably connected to said contact.

4,618,204

CONNECTION DEVICE

Yves Saligny, Cluses, France, assignor to Carpano & Pons, France

Filed Jun. 20, 1984, Ser. No. 622,388
Claims priority, application France, Dec. 5, 1980, 80 26161
Int. Cl.[4] H01R *9/24*
U.S. Cl. 339—99 R **9 Claims**



9. A connection device, in particular for telecommunication lines, comprising:

an insulating casing formed in two detachably assembled parts, the parts being substantially identical in structure, each part including an outer longitudinal side and an open assembly side, and having on the open assembly side a plurality of alternating projecting portions and recessed portions in the form of castellations, the projecting portions of one part being aligned with the recessed portions of the other part to allow the parts to be matingly interconnected axially, each part having a passage formed in each of its projecting portions and recessed portions, the passages of the projecting portions and recessed portions of one part being aligned with the passages of corresponding mating projecting portions and recessed portions of the other part;

a plurality of elongated, two ended conductor elements, the conductor elements extending axially through the casing and being arranged in parallel rows of opposite pairs, each opposite pair of elements being received by the aligned passages of the corresponding mating projecting portions and recessed portions of the casing parts so that each castellation contains only one opposite pair of conductor elements, each element being split at its opposite ends to receive a line-wire and being retained axially between the casing parts, the split ends being recessed within the casing from the outer longitudinal sides of the casing parts, each casing part including bridges formed on its outer longitudinal side, the bridges partially overlying the conductor elements for retaining the conductor elements within the casing;

each casing part including driving slots formed on its outer longitudinal side, the driving slots being aligned with the split ends of corresponding conductor elements; and

each casing part including sockets formed in proximity to its outer longitudinal side, each socket of each part being dimensioned to receive a corresponding split end of a conductor element.

4,618,205

LIGHT FIXTURE

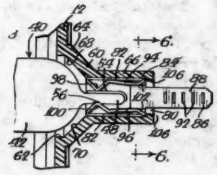
Jerry H. Freeman, Mt. Prospect, Ill., assignor to UNR, Inc., Chicago, Ill.

Continuation of Ser. No. 586,350, Mar. 5, 1984, abandoned. This application Nov. 21, 1985, Ser. No. 800,367
Int. Cl.[4] H01R *13/432/13/11*
U.S. Cl. 339—125 L **6 Claims**

1. A light fixture for receiving a wedge base light bulb having a body portion, and a base portion including a central portion and a pair of spaced apart generally flat side sections on respective opposite sides of said central portion, with contact wires respectively associated with a surface of each side section, with each said side section having a transverse

recess formed therein, comprising: a generally flat base member having a front side and a rear side, said base member having a centrally disposed opening formed therein; a socket member connected with said base member at said centrally disposed opening and extending outwardly from said rear side of said base member, said socket member having a front section for receipt of a portion of said body portion of the bulb and a rear section for receiving said base portion of the bulb, said rear section having a pair of spaced apart channels integrally formed therein, and a central channel between said spaced apart channels shaped to receive a central portion of said light bulb base portion; and a connector pin means received and retained in each of said spaced apart channels for respectively receiving each of the side sections of said bulb so as to cooperate with said recess formed in each said side section and thereby retain said base portion of said bulb in a position within said socket member and to contact said contact wire associated with the corresponding side section,

each said connector pin means including a clip portion for receipt of said respective side section of the base portion and for contacting said contact wire associated therewith, and a lead wire receiving portion for attachment of an electrical lead wire thereto, each said clip portion comprising a pair of spaced apart and facing spring clip sections extending integrally from opposite edges of said lead wire receiving portion, each said clip section having a first end defining a V-shaped section, the apexes of said V-shaped sections extending toward each other so that one of said V-shaped sections of the clip portion of each connector pin means is received in the transverse recess of the respective side section of the light bulb base portion,



each of said spaced apart channels being formed with a pair of opposed longitudinally extending grooves integrally formed in said rear section of said socket member, with each of said grooves terminating a short distance from the rear end of said spaced apart channels to thereby define a first inwardly extending surface at the rear end of each said groove, said spaced apart channels each further being formed with a second inwardly extending surface,

said clip portions of said connector pin means having a pair of spaced apart, outwardly extending inwardly resiliently deformable ear sections which respectively extend outwardly from second ends of said facing spring clip sections, said ear sections being respectively slidably received and retained within said grooves of each said channel by engagement of each said ear section with a respective one of said first inwardly extending surfaces,

each said connector pin means being formed with a ledge portion at the inner edge of said lead wire receiving portion which provides a third surface which is engageable with said second inwardly extending surface of the respective one of said spaced apart channels, whereby each said connector pin means is insertable into the respective one of said spaced apart channels from the rear of said socket member and retained in position therein with said connector pin means precluded from movement in one direction by contact between said ear sections and said first surfaces, and precluded from movement in the other direction by contact between said second and third surfaces, the clip sections of each said connector pin means being urged away from each other attendant to receipt of a respective one of said side sections of said bulb base portion therebetween.

4,618,206

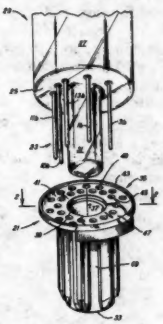
CATHODE RAY TUBE BASE

Robert L. Donofrio, Elbridge, and Peter G. Puhak, Seneca Falls, both of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Apr. 3, 1981, Ser. No. 250,999

Int. Cl.[4] H01R *33/74*

U.S. Cl. 339—144 T **6 Claims**



1. An improvement in a cathode ray tube base of the type employing a substantially arcuate application of dielectric adhesive for effecting adherence of said base to the closure portion of a tube wherefrom a sealed exhaust tubulation and a circular array of surrounding connective pins extends in parallel relationship, said base having an axial crown portion dimensioned to spatially encompass said tubulation, said crown portion having an open end and a closed end, an annular flanged portion extending outwardly from the open end of the crown, said flanged portion having an interfacial surface circumferentially bounded by an upstanding perimetrical rim, said interfacial surface and rim adapted for seating with the peripheral region of said tube closure portion, said interfacial surface being demarcated by a circular array of spaced pin positioning stations oriented about and adjacent to said crown portion, the majority of said stations having apertures traversing said flanged portion to accommodate the mating pin arrangement extending from said closure portion, said interfacial surface having a discrete inwardly recessed region wherein at least one of said pin-receiving apertures is oriented, said region extending entirely across the surface from the rim to the crown, said base improvement comprising:

a plurality of spaced-apart indents in the interfacial surface of said flanged portion, said indents located between said perimetrical rim and said array of pin stations in the expanse thereof not occupied by said recessed region, said indents providing a plurality of adhesive anchoring positions for subsequently effecting improved adhesion of said base to said closure portion.

4,618,207

TWO PIECE MODULAR RECEPTACLE

Raymond A. Silbernagel, Naperville, Ill., assignor to Molex Incorporated, Lisle, Ill.

Filed Jun. 5, 1985, Ser. No. 741,512

Int. Cl.[4] H01R *13/506*

U.S. Cl. 339—176 M **12 Claims**

1. A two-piece modular phone jack assembly of the type having a plug-receiving socket formed therein defined by a plug-receiving opening, opposed top and bottom surfaces

joined by opposed side surfaces extending from said opening to join a back surface, said jack assembly including

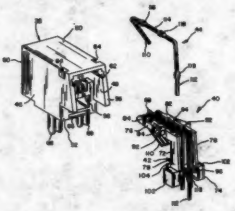
a connector housing having a forward end with the plug-receiving opening formed therein, two opposed side walls, the internal surfaces thereof defining said socket side surfaces, a top wall joining said side wals, a bottom wall joining said side walls, the internal surface of said bottom wall defining the bottom surface of said socket, and a rearward end with a rear opening formed therein,

a carrier subassembly in said housing mounted through said rear opening, said carrier subassembly having a dielectric support member and a plurality of stamped, metallic elongated conductors mounted on said support member, each conductor including a contact portion at one end extending from said forward end diagonally into the socket, a lead portion at the other end, and an intermediate portion between said contact portion and lead portion, and

means cooperating between said housing and subassembly to lock said subassembly to the housing,

the improvement in said carrier subassembly comprising:

a body portion adjacent said housing sidewalls and top wall and including an internal forwardly facing surface defining the back surface of the socket and an external rearwardly facing surface;



a base portion joining the bottom of the body portion having a contact-receiving structure with a plurality of rearwardly open slots formed therein for receiving and holding the conductor lead portions; and

a generally horizontal conductor mounting portion joining and extending forwardly of said body portion having an internal bottom surface defining the top wall of the socket and an upwardly facing conductor supporting surface, said conductor mounting portion having a forward edge against which the contact portions of the conductors are bent into the socket and a rearward edge joined to the top of the body portion against which the lead portions of the conductors are bent toward said base portion, and further having a plurality of means upstanding from said upwardly facing surface between said edges for positioning and holding the intermediate portions of the conductors which extend generally along the length thereof;

whereby a continuously open conductor-receiving pathway is defined between a point within the socket along said upwardly facing conductor supporting surface and said rearwardly facing surface of said body portion and a point within said open slots in said base portion.

4,618,208

CIRCUIT TEST CLIP

Osamu Igarashi, Yokohama, Japan, assignor to Nikko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1985, Ser. No. 791,762

Claims priority, application Japan, May 16, 1985, 60-71568[U]

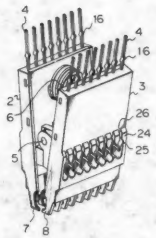
Int. Cl.⁴ H01R *11/22*

U.S. Cl. 339—200 P **6 Claims**

1. Circuit test clip having a pair of oppositely disposed support members pivotally connected to one another by an orthogonally crossing pin, each of said support members having a plurality of conducting elements extending longitudinally from a front to rear end of said support members, said conducting elements being juxtaposed at an interval corresponding to that of arrangement of terminals to be tested, and resilient means coacting with said support members for resiliently urging both of the front ends of the support members toward one another, the improvement wherein:

each of said support members is an assembly of an outer plate superposed on an inner plate which is shorter in length than the outer plate;

the outer plate having in the area confronting the inner plate a plurality of longitudinal slots juxtaposed at said interval for accommodating each of said conducting elements in each slot;



said outer and inner plates respectively having first and second projections extending in a direction in which one support member faces the other support member, each of said projections having holes for insertion of said pin, the inner plate having through-holes for insertion of said first projections on said outer plate;

the holes in said first projections being aligned with those in said second projections when the inner plate is superposed on the outer plate; and

the positions of the first and second projections on one of said support members being complementary with those of the first and second projections on the other support member.

4,618,209

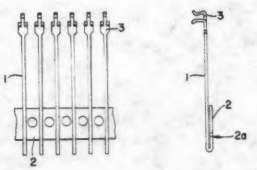
LEAD MEMBER AND METHOD OF FIXING THEREOF

Toshimitsu Sonobe, Tokyo, Japan, assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Oct. 19, 1984, Ser. No. 662,854

Int. Cl.⁴ H01R *13/10*

U.S. Cl. 339—258 R **10 Claims**



1. A lead member comprising:

plural leg pieces;

a removable interlink plate for holding said leg pieces spaced at a predetermined distance to interlink respective one ends of the leg pieces; and

terminal portions provided at the respective other ends of said leg pieces to attach to a PCB, a wire or the like;

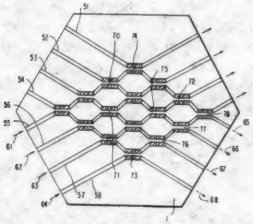
each of said leg pieces being folded to overlap said interlink plate forming thereby a leg portion at the folded section, said leg portions defining a plurality of insertion ends arranged for secured insertion into openings of a PCB or

the like while said interlink plate remains attached to said leg pieces.

4,618,210
OPTICAL SWITCH OF SWITCHED DIRECTIONAL COUPLER TYPE

Michikazu Kondo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,805
Claims priority, application Japan, Jun. 9, 1982, 57-98820; Sep. 7, 1982, 57-155456
Int. Cl.⁴ G02B *6/10*
U.S. Cl. 350—96.14 **8 Claims**



1. An optical switch having a number of switching elements for switching light beams to a plurality of optical waveguides constructed on a substrate, comprising:

a first group of optical waveguides consisting of N (N is an integer not smaller than 2) optical waveguides having a refractive index greater than that of the substrate;

a second group of optical waveguides consisting of M (M is an integer not smaller than 1) optical waveguides having a refractive index greater than that of the substrate;

directional couplers of a first kind, each consisting of one of the optical waveguides of said first group and an adjoining waveguide in the same group; and

directional couplers of a second kind, each consisting of the Nth optical waveguide of said first group and a first optical waveguide of said second group, each of said directional couplers of said second kind containing a pair of parallel optical waveguide sections of said Nth optical waveguide of said first group and said first optical waveguide of said second group, respectively, said pair of optical waveguide sections being closely arranged on a common plane of the substrate and extending a predetermined length, and a pair of control electrodes arranged close to said pair of optical waveguide sections, and

means for switching each of said directional couplers between an incomplete coupling in which less than 20 percent couples from one optical waveguide to another optical waveguide and a complete coupling in which almost 100 percent couples from one optical waveguide to another optical waveguide, in response to a potential difference of either zero volts or another prescribed value between each pair of said control electrodes, for incomplete coupling and complete coupling, respectively.

4,618,211
OPTICAL FIBER TAP WITH ACTIVATABLE CHEMICAL SPECIES

Paul A. Fleury, V, Basking Ridge, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

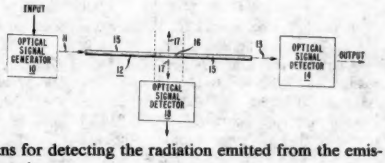
Filed Mar. 12, 1984, Ser. No. 588,223
Int. Cl.⁴ G02B *6/24*
U.S. Cl. 350—96.15 **13 Claims**

1. Communication system comprising

a. an optical fiber comprising a core and a clad and having an electromagnetic radiation absorption spectrum,

b. means for producing electromagnetic radiation of at least one given wavelength λ_o, the radiation to be referred to as "signal radiation", means for coupling at least part of the signal radiation into the fiber at a first fiber location, means for detecting signal radiation at a second fiber location spaced from the first fiber location, the signal radiation to be guided in the optical fiber from the first to the second fiber location,

c. means for causing emission of radiation from the fiber at a fiber region located between the first and the second fiber location, the means to be referred to as "emission means", the region of emission to be referred to as the "emission region", and



d. means for detecting the radiation emitted from the emission region,

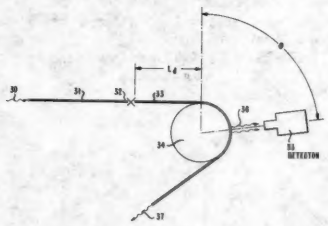
CHARACTERIZED IN THAT

e. the emission means can be placed at any point between the first and second fiber locations and comprise predisposed emission means, "predisposed emission means" being emission means that comprise a longitudinally substantially uniform distribution in the fiber of at least one activatable chemical species, incorporated into the fiber during manufacture of the fiber, the emission region formed by exposing a portion of the fiber to activating means.

4,618,212
OPTICAL FIBER SPLICING USING LEAKY MODE DETECTOR

Paul D. Ludington, Norcross, and Ian A. White, Roswell, both of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 30, 1984, Ser. No. 615,283
Int. Cl.⁴ G02B *6/38, 6/00*
U.S. Cl. 350—96.21 **14 Claims**



1. Method for splicing a first optical fiber to a second optical fiber, the first and second optical fibers being single mode optical fibers at a predetermined wavelength, the first fiber having a first fiber splice end, the second fiber having a second fiber splice end and a second fiber far end, the method comprising

(a) placing the first fiber splice end in proximity with the second fiber splice end,

(b) directing electromagnetic radiation of the predetermined wavelength through at least a part of the first fiber such that substantially all of the radiation arriving at the first fiber splice end is fundamental mode radiation, with the arriving radiation being emitted from the first fiber splice end, with at least a part of the emitted radiation being coupled into the second fiber splice end,

(c) stripping radiation from the second fiber at a fiber region between the second fiber splice end and the far end,
(d) detecting at least a part of the stripped radiation with detection means having an output,
(e) adjusting the relative position of the fiber splice ends in response to the output of the detection means, and
(f) splicing the first fiber to the second fiber,
characterized in that
(g) the radiation stripped from the second fiber consists substantially of nonfundamental mode radiation.

4,618,213

GELATINOUS ELASTOMERIC OPTICAL LENS, LIGHT PIPE, COMPRISING A SPECIFIC BLOCK COPOLYMER AND AN OIL PLASTICIZER

John Y. Chen, Pacifica, Calif., assignor to Applied Elastomerics, Incorporated, Pacifica, Calif.

Continuation-in-part of Ser. No. 458,703, Jan. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 134,977, Mar. 28, 1980, Pat. No. 4,369,284, said Ser. No. 134,977, is a continuation-in-part of Ser. No. 916,731, Jan. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 815,315, Jul. 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 778,343, Mar. 17, 1977, abandoned. This application Jan. 18, 1984, Ser. No. 572,172

The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.

Int. Cl.[4] C08K *5/01*; G02B *6/00, 5/04*

U.S. Cl. 350—96.34 **22 Claims**

1. A gelatinous elastomer composition consisting essentially of:
(a) 100 parts by weight of triblock copolymer of the general configuration poly(styrene-ethylene-butylene-styrene) wherein said styrene end block to ethylene and butylene center block ratio is within the range of from between 31:69 to 40:60;
(b) from about 300 to about 1,600 parts by weight of a plasticizing oil;
(c) said gelatinous elastomer composition having a gel rigidity of about 20 gram to about 700 gram Bloom.

4,618,214

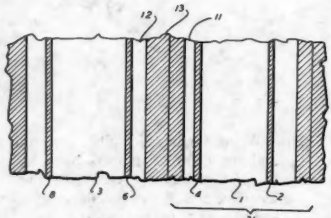
METHOD OF FABRICATING A CONTROLLED HARMONIC BINARY GRATING

Bruce A. Horwitz, Newton Centre, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Oct. 26, 1984, Ser. No. 665,255

Int. Cl.[4] G02B *5/18*

U.S. Cl. 350—162.2 **19 Claims**



1. A method of fabricating a controlled harmonic binary grating having both binary magnitude and phase transmissions in which specified harmonics are modified by enhancement or suppression, comprising the steps of:
a. manifesting a plurality of binary pulse trains $P(X;A_1)$, $P(X;A_2)$, $P(X;A_3)$ . . . , which when summed, produce a series expansion having the form of equation (3) of the specification;
b. setting up a plurality of simultaneous equations by equating the bracketed portion of equation (3) of the specification to zero for each order n to be suppressed, and to a maximum for each order n to be enhanced;
c. solving for the parameters A_1, A_2, A_3 . . . including the constraint of equation (3);
d. establishing the pulse widths of said plurality of binary pulse trains in accordance with the solved parameters of step c;
e. summing said plurality of binary pulse trains resulting from performing step d to produce a transmission function of said binary grating;
f. utilizing said transmission function to construct said grating.

4,618,215

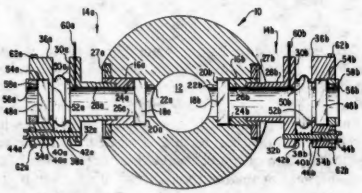
DOUBLE WINDOW VIEWING CHAMBER ASSEMBLY

Vernon W. Keller; Robert B. Owen; Bobby R. Elkins, and William T. White, all of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 2, 1985, Ser. No. 729,766

Int. Cl.[4] G02B *7/00*

U.S. Cl. 350—319 **17 Claims**



1. In a viewing chamber apparatus having a chamber wall in which a coolant is circulated to provide cooling of the chamber, an optical viewing arrangement comprising first and second window assemblies respectively mounted in first and second opposed openings in the chamber wall such that said window assemblies are in optical alignment whereby a light beam can enter and exit from the chamber directly, said window assemblies each comprising inner and outer windows mounted in spaced relationship so as to define a volume therebetween, and flexible mounting means for the outer one of the windows for permitting adjustment of the positioning of said outer window whereby the inner and outer windows can be brought into optical alignment.

4,618,216

BACKLIGHTED LIQUID CRYSTAL DISPLAY USING LIGHT PASSAGE MEMBER FOR MORE NEARLY UNIFORM ILLUMINATION

Osamu Suzawa, Shiojiri, Japan, assignor to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 245,856, Mar. 20, 1981, Pat. No. 4,487,481. This application Dec. 10, 1984, Ser. No. 680,192

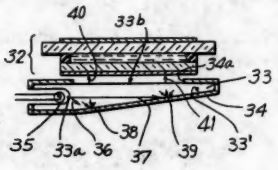
Claims priority, application Japan, Mar. 24, 1980, 55-38295[U]; Jun. 5, 1980, 55-75831; Jun. 26, 1980, 55-87056

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—345 **28 Claims**

1. A liquid crystal display device comprising:
a liquid crystal display panel;
light source means for illuminating said liquid crystal display panel;
a light passage member of one of a transparent and a translucent material, said light passage member being disposed between said liquid crystal panel and said light source means; and

a light relecting member substantially surounding said light source means and said light passage member, said light reflecting member having an opening facing said liquid crystal display panel to expose a surface portion of said light passage member, said light passage member and light reflecting member being adapted to provide light more uniformly across said display panel at varying distances from said light source means with the length of a light



path between said light source and said exposed surface portion being substantially uniform throughout said light passage member by reducing the distance between the reflecting member and the display panel as the distance from the light source means increases;

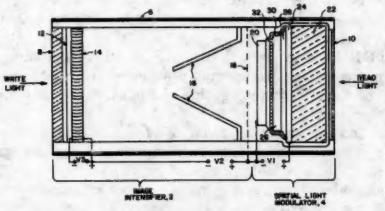
wherein the reflecting member is one of a metal plate, a metal film and a lamination sheet of aluminum and plastic adhered to surface portions of said light passage member other than said opening.

4,618,217

ELECTRON-BOMBARDED SILICON SPATIAL LIGHT MODULATOR

David Armitage, Los Altos, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 8, 1985, Ser. No. 689,681
Int. Cl.[4] G02F *1/03;* H01V *31/50*
U.S. Cl. 350—355 **5 Claims**



1. An electron-bombarded silicon spatial light modulator comprising:

an evacuated chamber having an image intensifier and a spatial light modulator enclosed therein;

said image intensifier including

a photoemissive element for receiving a write illumination and emitting electrons representative of said write illumination, and

a microchannel plate multiplier receiving said electrons and providing an increased number of said electrons,

said spatial light modulator including

a silicon substrate having a first surface and an opposed second surface, said first surface of said silicon substrate having p-type material diffused therein to form a photodiode,

a dielectric mirror having a first surface and an opposed second surface, said first surface of said dielectric mirror being adjacent said second surface of said silicon substrate,

an electro-optic crystal having a first surface and an opposed second surface, said first surface of said electro-optic crystal being adjacent said second surface of said dielectric mirror,

a transparent electrode having a first surface and an opposed second surface, said first surface of said transparent electrode being adjacent said second surface of said electro-optical crystal, and

a transparent supporting substrate having a first surface and an opposed second surface, said first surface of said transparent supporting substrate being adjacent said second surface of said transparent electrode,

means for applying a first voltage between said p-type silicon material and said transparent electrode to reverse bias said photodiode; and

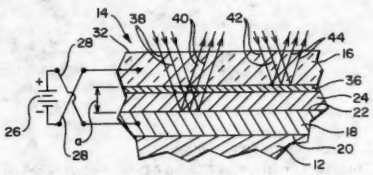
means for applying a second voltage between said microchannel plate multiplier and said p-type silicon material whereby said increased number of said electrons are accelerated towards said p-type silicon material to strike said p-type silicon material with sufficient energy to form electron-hole pair combinations within said silicon substrate.

4,618,218

RADIATION MODULATING APPARATUS AND METHOD

Christopher G. Shaw, Redmond, and Ted J. Kramer, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 19, 1984, Ser. No. 602,140
Int. Cl.[4] G02B *5/28*
U.S. Cl. 350—363 **20 Claims**



1. An apparatus to selectively modify emission or absorption of radiation within a predetermined wavelength range and also modify reflection of radiation within said predetermined wavelength range, said apparatus having a radiation emitting or receiving axis along which said apparatus is adapted to be oriented so that the axis is generally parallel to a major path component of the radiation, said apparatus having a front side and a rear side relative to said axis, with the front side adapted to be positioned to emit or initially receive the radiation, said apparatus comprising:

a. a front substantially transparent electrode having a front face and a rear face, and occupying a plane having a major alignment component substantially perpendicular to said radiation emitting or receiving axis;

b. a substantially transparent electrolyte positioned behind said front electrode and in electrolytic contact with the rear face of the front electrode;

c. a second electrode positioned to be in electrolytic contact with said electrolyte;

d. a selectively operable voltage source to impose a voltage between said electrode where the first electrode can be charged either negatively or positively relative to the second electrode to either deposit a partially reflective coating at the rear surface of the first electrode or remove said coating from the rear surface of said electrode;

e. said apparatus providing a substantially fully reflective

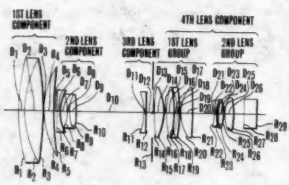
surface spaced behind the rear surface of the first electrode at a predetermined spacing distance along said radiation emitting/receiving axis, whereby with the coating deposited on the rear face of the first electrode, destructive optical interference minimizes surface reflectance of the reflective surface and thus maximizes surface emittance of said apparatus, and with said coating being removed from the rear face of the first electrode, the surface reflectance of the reflective surface is maximized and thus the surface emittance is minimized.

4,618,219

ZOOM LENS

Muneharu Sugiura; Kazuo Fujibayashi, and Sadahiko Tsuji, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 581,953
Claims priority, application Japan, Feb. 24, 1983, 58-29916
Int. Cl.[4] G02B *15/14*
U.S. Cl. 350—427 **4 Claims**



1. A zoom lens comprising:

a first lens component having a positive refractive power for focusing the lens;

a second lens component on the image side of said first lens component and having a negative refractive power for varying the magnification power of the lens, said second lens component including, from front to rear, a negative meniscus-shaped lens having a strong refracting rear surface, and another negative meniscus-shaped lens having a strong refracting front surface and a cemented surface of forward convexity;

a third lens component on the image side of said second lens component and having a negative refractive power for compensating for the image shift resulting from the change of the magnification power; and

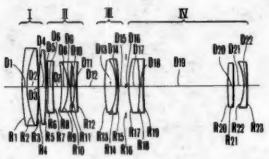
a fourth lens component on the image side of said third lens component and having a positive refractive power for forming an image of an object, a front group of said fourth lens component including, from front to rear, a bi-convex lens having a rear surface of strong curvature, another bi-convex lens having a front surface of strong curvature, a lens of negative power having a front surface of strong curvature and a lens of positive power having a front surface of strong curvature, and a second group of said fourth lens component including, from front to rear, a bi-concave lens having a surface of strong curvature, a bi-convex lens with a rear surface of strong curvature, and another bi-convex lens having a front surface of strong curvature.

4,618,220

TELEPHOTO ZOOM LENS

Masatake Kato, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 652,421, Sep. 19, 1984, abandoned, which is a continuation of Ser. No. 373,642, Apr. 30, 1982, abandoned. This application May 2, 1985, Ser. No. 729,890
Claims priority, application Japan, May 13, 1981, 56-70790
Int. Cl.[4] G02B *15/00*
U.S. Cl. 350—427 **3 Claims**



1. A telephoto zoom lens comprising:

four lens groups, from front to rear, as follows:

the 1st lens group having a positive refractive power, the 2nd lens group having a negative refractive power, the 3rd lens group having a positive refractive power, and the 4th lens group having a positive refractive power;

said 1st, said 2nd and said 3rd lens groups forming a varifocal section, and when zooming from the wide angle side to the telephoto side, said 1st and said 2nd lens groups being moved axially in opposite directions in such a manner that the space between said 1st and 2nd lens groups gradually increases, thus effecting a change in image magnification, and said 3rd lens group reciprocates to compensate for the shift of an image plane resulting from the change of image magnification, and said 4th lens group being stationary; and satisfying the condition of

$$1.4<(fI+fII-e'_1)(1-1/Z)/\eta a<6.1$$

wherein fI denotes the focal length of the 1st lens group, fII the focal length of said 2nd lens group, e'_1 the interval between the principal planes of said 1st and said 2nd lens groups when in the shortest focal length position, and Z the zoom ratio;

said 1st lens group consisting, from the object side, of a cemented lens comprising a negative meniscus lens convex towards the object side of a positive lens, and a positive lens;

said 2nd lens group consisting of a negative lens, a cemented lens comprising a positive meniscus lens and a negative lens, and a negative lens; and

said 3rd lens group consisting of a cemented lens comprising a positive lens and a negative meniscus lens.

4,618,221

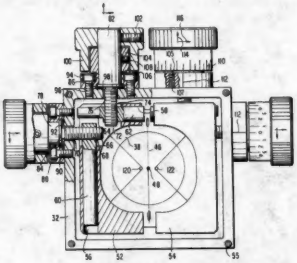
ADJUSTABLE RETICLE DEVICE

Richard L. Thomas, Rte. 3, Box 369, Wardensville, W. Va. 26851

Filed Oct. 27, 1982, Ser. No. 437,069
Int. Cl.[4] G02B *23/00*
U.S. Cl. 350—566 **6 Claims**

5. A telescopic sight comprising a hollow cylindrical tube, objective lens means secured to one end of said tube, an additional lens means located within said tube to define a first focal plane adjacent one end of said tube intermediate said objective lens means and said additional lenses and a second optical plane adjacent the opposite end of said tube, an adjustable reticle device secured to said opposite end of said tube comprised of a fixed reticle means and two identical reticle means coplanar with said fixed reticle means and moveable independently of each other along two paths disposed at right angles to each

other on opposite sides of said fixed reticle means and an eye piece having ocular lens means therein secured to said adjust-



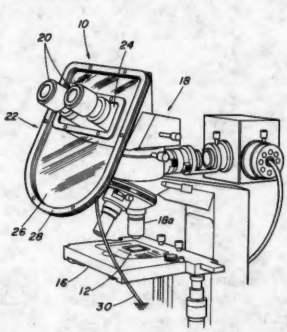
able reticle device for focusing on said reticle means in said second focal plane.

4,618,222

PROTECTIVE STRUCTURE AND METHOD FOR WORKING ON SENSITIVE ELECTRONIC DEVICES

Philip H. Eisenberg, Downey, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Aug. 27, 1984, Ser. No. 644,599
Int. Cl.[4] G02B *21/00*; H05F *3/02*
U.S. Cl. 350—582 **5 Claims**



1. In a processing station for manufacturing contaminatable parts on the slide stage of a microscope by an operator viewing through the microscope viewing stage, the improvement comprising

a planar transparent cough shield mounted about said viewing stage, said shield extending laterally away from the microscope viewing stage in all directions in a plane generally normal to the viewing axis and oriented generally in a plane parallel to the face of the operator so that the operator may see through the cough shield for manipulating parts on the microscope slide stage,

said shield extending below the viewing stage a distance sufficient to intercept the breath or cough of the operator,

said shield being made of a self-supporting transparent layer, and

a continuous anti-static sheet including a thin conductive film supported by said transparent layer to form an anti-static barrier thereon, said film extending fully across the transparent layer and said film being thin enough to be usefully transparent,

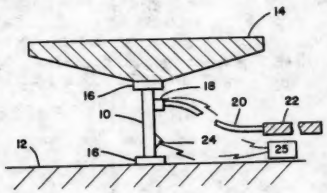
means connecting the edges of said film to ground.

4,618,223

THERMOELECTRIC ACTUATOR FOR MIRROR ADJUSTMENT

Lawrence Fried, Palo Alto, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 29, 1983, Ser. No. 537,194
Int. Cl.[4] G02B *7/18*
U.S. Cl. 350—611 **5 Claims**



1. A device for thermoelectrically adjusting a mirror in a plane normal to the mirror surface comprising:

(a) a support structure for said mirror;

(b) at least one generally tubular member having one end attached to a predetermined location on the underside of said mirror, said tubular member changing dimensionally with temperature such as to apply pressure to said location on said mirror;

(c) a pair of thermally isolating connectors operably connecting an end of said tubular member opposite said mirror to said support structure;

(d) a thermoelectric element mounted on said tubular member;

(e) a variable-conductance heat pipe operably connected between a heat sink/source and said thermoelectric element; and

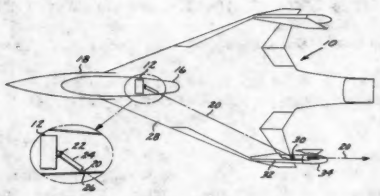
(f) means for determining the temperature of said tubular member, said means for determining transmitting an output signal.

4,618,224

SYSTEM FOR TRANSMITTING A LASER BEAM FROM ONE LOCATION ON AN AIRCRAFT EXTERNALLY TO A REMOTE RECEIVER

Eugene A. Smith, Hawthorne, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Feb. 8, 1985, Ser. No. 699,704
Int. Cl.[4] G02B *5/08, 5/10*
U.S. Cl. 350—618 **7 Claims**



1. An aircraft having a laser system associated therewith, the aircraft having a fuselage and wings comprising

a wing tip pod mounted to one of said wings,

a source of a laser beam mounted on the aircraft at a first location on the fuselage,

means for tansmitting said laser beam externally of the aircraft from said first location to the wing tip pod, said beam

being transmitted directly to said receiving means without interference with the structure of the aircraft,

receiving means located within said wing tip pod for receiving and redirecting said beam, and including

turret means rotatably mounted to the aft of said wing pod, and

an optical relay train for directing the received beam to said turret means.

4,618,225

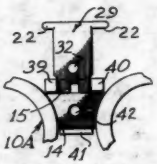
LENS HOLDER AND CARRIER FOR SAFETY MASKS

Sidney Shedrow, 202 E. Gaston St., Savannah, Ga. 31401

Continuation-in-part of Ser. No. 459,414, Jan. 20, 1983, Pat. No. 4,542,965. This application Sep. 19, 1985, Ser. No. 777,959

Int. Cl.[4] G02C *7/08, 5/04, 5/02*

U.S. Cl. 351—57 **4 Claims**



1. A lens holding means for supporting a pair of lenses within a safety mask before the eyes of the wearer of said safety mask, said safety mask having a face plate, said lens holding means comprising a pair of lens holders, a bridge extending between said pair of lens holders and fixed to both lens holders of said pair of lens holders for supporting said lens holders with respect to each other in generally the same plane, said bridge being bendable for allowing said lens holders to lie in planes angularly related to each other for contouring said lens holding means to fit the face of said wearer and to fit within said safety mask, said bridge including carrying means for supporting said bridge from said face plate of said safety mask, said carrying means comprising a hinge fixed to the upper edge of said bridge, and a carrier fixed to said hinge, said hinge being bifurcated at said bridge for facilitating said bending of said bridge, said carrier including tabs extending laterally therefrom, said carrier defining a hole therein between said tabs and said hinge, and further including a bracket fixed to said face plate of said safety mask, said bracket including recesses for receiving said tabs such that said carrier is rotatable about said tabs, and a post extending from said bracket and receivable through said hole in said carrier on rotation of said carrier against said bracket.

4,618,226

SPRING MOUNT HINGE FOR EYEGLASSES BOWS

Rino Sartor, Montebelluna, and Giampietro Bottega, Segusino, both of Italy, assignors to Celes Optical S.r.l., Pederobba, Italy

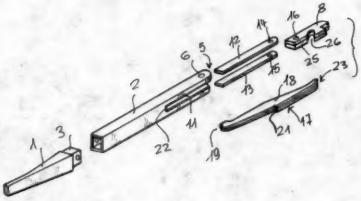
Filed Jan. 30, 1984, Ser. No. 575,641

Claims priority, application Italy, Feb. 4, 1983, 41521 A/83

Int. Cl.[4] G02C *5/16*

U.S. Cl. 351—113 **10 Claims**

1. An elastic-hinge mounted temple for an eyeglass bow, comprising a head member rigid with a front portion of the eyeglass bow and a leg member pivoted to said head member, said leg member including a tubular portion accommodating therein a leaf spring with a substantially lozenge shape in the unbiased condition thereof, said leaf spring being secured to said leg member with a first end thereof, urging against said head member with a free end thereof, opposite to said first end, and selectively acting upon a part of said tubular portion with a middle portion thereof, said leaf spring middle portion operating as a pivot axis for said leaf spring free end during the pivotal movement of said leg member, said head member having a first engagement surface, a second engagement surface substantially transverse to said first engagement surface and a recess seat for said leaf spring free end, said first and second surfaces and said recess seat cooperating with said leaf



spring free end to define an opened and a closed stable angular position of said leg member and an unstable elastic-return extra-opened position of said leg member wherein said leaf spring is elastically deformed with respect to said substantially lozenge shape.

4,618,227

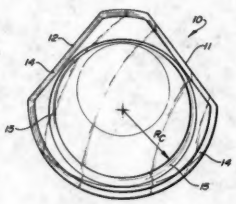
SOFT CONTACT LENS

Charles A. Bayshore, Orlando, Fla., assignor to Vistakon, Inc., Jacksonville, Fla.

Filed Oct. 7, 1983, Ser. No. 539,874

Int. Cl.[4] G02C *7/04, 7/06*

U.S. Cl. 351—161 **14 Claims**



1. A soft contact lens comprising a prism lens body having a central vertical axis and a thickness which increases from a minimum to a maximum along said vertical axis to provide a base-down prism ballast, said lens body having a generally spherical, concave back surface adapted to fit the cornea of a human eye and a generally convex front surface, said lens body having a central optical zone and a peripheral border zone and a channel circumscribing said optical zone in at least one surface of said lens body, the depth of said channel increasing uniformly from a minimum at the apex of said prism ballast to a maximum at the base of said prism ballast.

4,618,228

BIFOCAL CONTACT LENS OF THE BIVISUAL TYPE

Heinz Baron, Frechen-Buschbell; Peter Hoefer, Aschaffenburg, and Herbert Schwind, Glattbach, all of Fed. Rep. of Germany, assignors to Titmus Eurocon Kontaktlinsen GmbH, Aschaffenburg, Fed. Rep. of Germany

Filed Dec. 9, 1983, Ser. No. 559,735

Int. Cl.[4] G02C *7/04, 7/06*

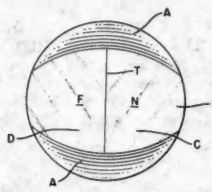
U.S. Cl. 351—161 **4 Claims**

1. A bifocal contact lens of the bivisual (simultaneous-vision) type, comprising:

a reading-focusing lens part (N) and a distance-focusing lens

part (F) of different refractive powers and a transitional area (T) therebetween, and

means for stabilizing of the lens on the eye in such a way that



the transitional area (T) runs from the lower to the upper part of the lens with the reading-focusing lens part (N) located nasally and the distance-focusing lens part (F) located temporally when the lens is in situ.

4,618,229

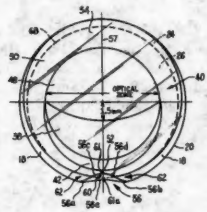
BIFOCAL CONTACT LENS

Benjamin L. Jacobstein, Coral Gables; Thomas J. Mestrits, Coconut Grove, and Murray Miller, Miami, all of Fla., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jul. 22, 1983, Ser. No. 516,489

Int. Cl.[4] G02C *7/04, 7/06*

U.S. Cl. 351—161 **9 Claims**



1. A prism ballasted contact lens comprising:

a posterior surface having a substantially circular boundary;

an anterior surface; and

a peripheral edge zone contiguous with said posterior and anterior surfaces, said peripheral edge zone being configured to define a stabilizing and vent zone in the prism ballast area, having two thickened stabilizing portions spaced from each other by a substantially flat vent surface which tapers from said anterior surface toward said posterior surface and which intersects said posterior surface along an arcuate line of curvature reverse to the curvature of the substantially circular boundary of the posterior surface, said vent surface partially releasing constrictive engagement between said lens and the eye, said stabilizing portions stabilizing said contact lens and preventing said lens from rotating on the eye of the wearer.

4,618,230

VISUAL STIMULATOR

John Ens, Burnaby; James A. McEwen, Richmond, and Craig W. Beattie, Burnaby, all of Canada, assignors to Vancouver General Hospital, Vancouver, Canada

Filed Jun. 24, 1982, Ser. No. 391,972

Int. Cl.[4] A61B *3/10*

U.S. Cl. 351—221 **8 Claims**

1. A visual stimulator, comprising:

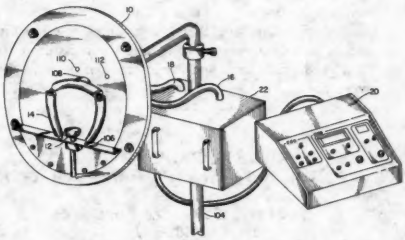
light directing means for directing light from a light source into a subject's eyes;

attenuator means for selectably attenuating said light source;

photo-detector means for producing a first output signal representative of the radiant energy directed onto the subject's eyes; and

signal processing means for receiving and processing said first output signal to derive therefrom further output signals representative of the radiometric or photometric characteristics of said radiant energy;

said attenuator means including:



(a) a first shutter leaf affixed to a first galvanometer shaft; and,

(b) a second shutter leaf affixed to a second galvanometer shaft;

wherein said shutter leaves are positioned for pivotal movement with said galvanometer shafts to attenuate light from said light source passing between said shutter leaves.

4,618,231

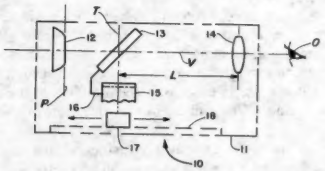
ACCOMMODATIVE AMPLITUDE AND SPEED MEASURING INSTRUMENT

Louis V. Genco, Enon, and Harry L. Task, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 22, 1984, Ser. No. 582,496

Int. Cl.[4] A61B *3/02*

U.S. Cl. 351—237 **12 Claims**



1. An instrument for measuring the accommodative speed of the eye of a subject, comprising:

a. a first visual display in a preselected pattern, said first display disposed a predetermined distance from said subject for viewing along a first optical axis;

b. a second display in a preselected pattern disposed along a second optical axis intersecting said first axis;

c. at least one display of said first display and said second display comprising a pattern having a plurality of distinct and recognizable orientations with respect to the axis along which said at least one display is viewed;

d. imaging means, intermediate said first display and said subject, for optically imaging said second display along said first axis and thereby superimposing the image of the pattern of said second display onto the image of the pattern of said first display for viewing by said subject along said first axis;

e. means, structurally interconnecting said second display and said imaging means, for selective positioning of said second display, and said imaging means along a direction

parallel to said first axis and between said first display and said subject;

f. electronic means, operatively connected to said first display and said second display, for randomly and alternately generating the patterns thereof, and for randomly generating said at least one display in any one of said plurality of orientations;

g. switching means operable by said subject and connected to said first display and said second display for selectively turning the displays on and off; and

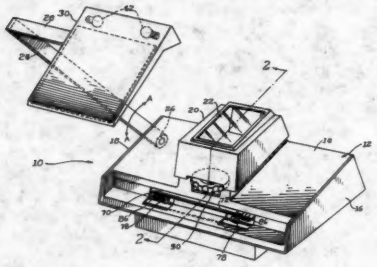
h. recording means, operatively connected to said switching means and said electronic means for recording the last displayed orientation and the interval of time the displays were on.

4,618,232

DESK TOP MICROFORM READER

Thomas R. Wells, Indian Creek, Ill., assignor to Bell & Howell Company

Filed Dec. 21, 1984, Ser. No. 685,086
Int. Cl.[4] G03B *21/24*
U.S. Cl. 353—79 **5 Claims**



1. A desk top microform reader for use on a horizontal, planar surface comprising:

a housing structure, enclosing projection means and microform receiving means,

an L-shaped supporting arm having two ends, a vertically rising end mounted to one side of the housing structure, and a horizontally extending end attached to the vertically rising end and extending in the direction of the housing structure,

a hood connected to and supported by the horizontally extending end, the hood connected to the horizontally extending end by means of a pivot connection, the hood being selectively pivoted about an axis parallel to the vertically rising end to either of two positions, with one of the positions being an image projection position,

at least two abutment walls on the hood that contact the horizontally extending end at the two positions for accurately positioning the hood when it is pivoted from one position to the other,

reflecting means mounted on the hood in spaced relationship with respect to the horizontal, planar surface,

the microform receiving means comprising means to hold the microform in a flat, horizontal plane,

the projection means being optically coupled to the reflecting means when the hood is pivoted to the image projection position for projecting onto the horizontal flat planar surface an optical image corresponding to an image on a microform when the image is placed in the projection means, and

a substantially unenclosed, uninterrupted, optical image projection path extending from the projectiong means to the reflecting means and to the horizontal planar surface to project the image from a horizontally held microform onto a horizontal planar surface without the need of an enclosure to exclude ambient light.

4,618,233

SCANNING WEDGE METHOD FOR DETERMINING CHARACTERISTICS OF A PHOTORESIST

Walter G. Hertlein, Jona, Switzerland, assignor to Shipley Company Inc., Newton, Mass.

Filed May 20, 1985, Ser. No. 736,431
Int. Cl.[4] G03B *41/00*
U.S. Cl. 354—20 **10 Claims**

FULL EXPOSURE DOSE
REGION OF COMPLETE RESIST REMOVAL
INTERFERENCE FRINGES DUE TO THE RESIST THICKNESS TAPER
NO EXPOSURE

8. A photoresist test mask comprising:

an optically transparent substrate; and

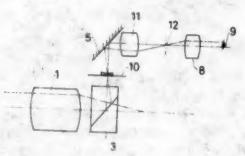
a coating of a granular matter on the top surface of the substrate that linearly varies from no coating to an opaque coating.

4,618,234

FINDER OPTICAL SYSTEM FOR CAMERAS

Kazuo Ikari, Hachiouji, and Toru Fujii, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1985, Ser. No. 717,092
Claims priority, application Japan, Mar. 29, 1984, 59-61766
Int. Cl.[4] G03B *13/08*
U.S. Cl. 354—225 **4 Claims**



1. A finder optical system for cameras comprising a photographing lens, a half-mirror for dividing light having passed through said photographing lens into two, a screen on which an image of an object to be photographed is to be formed by light having passed through said photographing lens and reflected by said half-mirror and a relay lens for forming said image in a front side focal position of a magnifying lens, a relation of $0.2 \leqq f_{oc}/L \leqq 0.8$ being satisfied, where a focal length of the magnifying lens is represented by f_{oc} and distance from the screen to a front side principal point position of the magnifying lens is represented by L.

4,618,235

FOCUS DETECTING DEVICE FOR A CAMERA

Tokuji Ishida, and Masataka Hamada, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

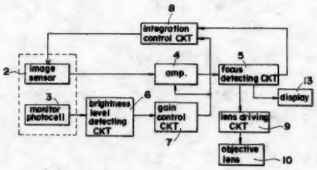
Filed Jul. 12, 1985, Ser. No. 754,282
Claims priority, application Japan, Jul. 16, 1984, 59-148091
Int. Cl.[4] G03B *3/00, 15/05*
U.S. Cl. 354—403 **16 Claims**

1. A focus detecting device for a camera which includes an objective lens, said device comprising:

an image sensor for generating an image signal, said image sensor including photoelectric converter means for converting the intensity of light incident thereon into an amount of electric charge and charge intergration means for integrating the converted amount of charge;

a focus detection optical system for forming an image of an object on said image sensor;

integration control means for controlling integration time of said charge integration means to terminate an integration operation when the level of integrated charge reaches a given level within a first given time and terminate the integration operation upon lapse of the first given time when the level of the integrated charge doesn't reach the given level within the first given time;



amplifier means for amplifying the image signal of said image sensor by a given gain;

gain control means for controlling and determining the gain of said amplifier means in accordance with brightness of the object;

focus condition detecting means for detecting a focus condition of said objective lens in accordance with an amplified image signal from said amplifier means;

discrimination means for discriminating whether a focus condition detection is possible or not and generating a discrimination signal when the focus condition detection is impossible; and

changing means responsive to the discrimination signal for replacing the first given time by a second given time which is longer than the first given time.

4,618,236

FOCUS DETECTING APPARATUS

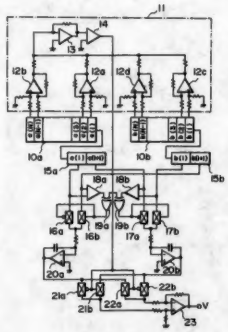
Akira Akashi; Akira Ishizaki; Akira Hiramatsu; Yasuo Suda, all of Yokohama, and Keiji Ohtaka, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1984, Ser. No. 667,818

Claims priority, application Japan, Nov. 8, 1983, 58-209535

Int. Cl.[4] G03B *3/00*; G01J *1/36*

U.S. Cl. 354—406 **3 Claims**



1. A focus detecting apparatus for detecting a focus state of an objective lens, comprising:

optical means for forming a plurality of images from an object;

sensing means comprising a plurality of photosensitive elements for sensing said images and producing output signals, relative positional relation of said images on said sensing means varying in accordance with the focus state of said objective lens;

discriminating means for discriminating the focus state of the objective lens on a basis of the outputs of said sensing means to detect the focus state of said objective lens, said discriminating means having two different processes for discriminating the focus state of said objective lens, one of said two processes being executed with signals, each of which is the smaller of the signals output from the two photosensitive elements which correspond to each other, and the other process being executed with signals, each of which is the larger of the signals output from the two photosensitive elements which correspond to each other; and

evaluation means for evaluating said images on the basis of the outputs from said sensing means to select a preferred process from said two processes thereby to control said discriminating means so as to effect discrimination of the focus state of the objective lens in accordance with the preferred process.

4,618,237

MOTOR DRIVE FOR CAMERA

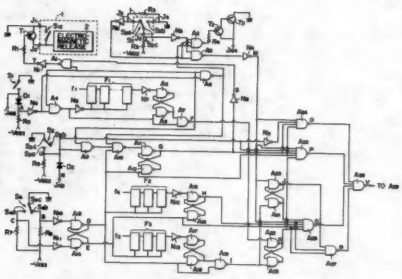
Masahiro Kitagawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd, Tokyo, Japan

Continuation of Ser. No. 587,637, Mar. 8, 1984, abandoned. This application Jul. 29, 1985, Ser. No. 760,136

Claims priority, application Japan, Mar. 17, 1983, 58-44860

Int. Cl.[4] G03B *7/00*

U.S. Cl. 354—412 **22 Claims**



1. A motor drive for mechanically transmitting the rotation of a motor to a camera to which the motor drive is releasably mounted in order to enable a shutter release operation of the camera shutter and/or a film winding operation within the camera; comprising:

means in said motor drive for producing a motor drive signal and an electromagnetic release signal substantially simultaneously in response to the operation of an operating member in said motor drive, both said motor drive signal and said electromagnetic signal being electrical signals;

means for transmitting the electromagnetic release signal from the motor drive to said camera which is of the electromagnetic release type and which includes a shutter release mechanism;

said shutter release mechanism including means responsive to said electromagnetic release signal for transmitting an exposure operation signal from said camera of the electromagnetic release type to the motor drive just prior to operation of the shutter, the exposure operation signal being produced by means for detecting the exposure oper-

ation, which means is located within said camera of the electromagnetic release type; means for preventing the rotation of the motor in response to the exposure operation signal during the exposure operation and means for energizing the motor when the exposure operation signal is absent and the motor drive signal is present.

4,618,238

CAMERA

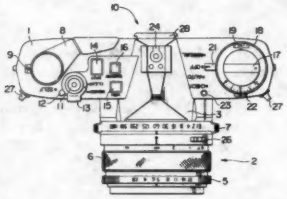
Yoshihisa Maitani; Katsuhiko Tsunefuji, and Masafumi Yamasaki, all of Hachioji, Japan, assignors to Olympus Optical, Co. Ltd., Tokyo, Japan

Division of Ser. No. 485,432, Apr. 15, 1983, Pat. No. 4,589,754. This application Oct. 12, 1984, Ser. No. 661,243

Claims priority, application Japan, Apr. 21, 1982, 57-65385

Int. Cl.[4] G03B *7/08, 17/20*

U.S. Cl. 354—431 **13 Claims**



9. A camera including average photometric means and spotwise photometric means which can be selectively activated to permit a photographing operation in an average photometry mode and in a spotwise photometry mode; comprising:

an operating member to change the photographing mode from the average mode to the spotwise mode; and

means for automatically changing the photographing mode from the spotwise mode to the average mode in response to the completion of the photographing operation in the spotwise mode.

4,618,239

PHOTOGRAPHIC APPARATUS AND MEASUREMENT METHOD OF EXPOSURE CONDITIONS

Takashi Sakamoto, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

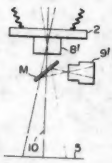
Filed Oct. 4, 1984, Ser. No. 657,751

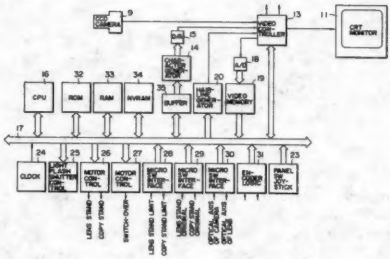
Claims priority, application Japan, Oct. 12, 1983, 58-189352

Int. Cl.[4] G03B *7/099, 27/74*

U.S. Cl. 354—477 **3 Claims**

1. A photographic apparatus comprising a photographic camera including a camera lens defining an optical axis, a photoelectric camera having a light sensing means to sense light conditions of a subject to be photographed, and means to position the photoelectric camera sensing means at a location which is in effect on the optical axis of the camera lens when it is in its normal operating position, said sensing means location corresponding to the location of the lens relative to a subject to be photgraphed, wherein said apparatus further comprises a light sensor processing circuit capable of measuring illumance distribution of the surface of a subject, $\cos^4\theta$ law





effects, variation in density of a image, and changes in intensity of light sources.

4,618,240

HEATING DEVICE HAVING A HEAT INSULATING ROLLER

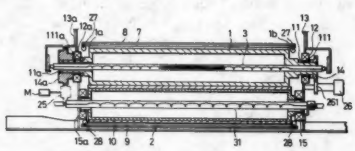
Masaaki Sakurai, Hanno, and Kazuo Kagiura, Iokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1983, Ser. No. 475,381

Claims priority, application Japan, Mar. 16, 1982, 57-42211; Mar. 17, 1982, 57-42409; Mar. 26, 1982, 57-49724; Sep. 9, 1982, 57-157084

Int. Cl.[4] G03G *15/20*

U.S. Cl. 355—3 FU **61 Claims**



1. A heating device comprising:

a heating roller for heat-treating an object to be heated;

heat loss preventing means provided at end portions of said roller to prevent heat loss from the end portions of said roller resulting from conduction and having heat-resistant insulating members to keep said heating roller under a thermally floated condition;

means for heating said roller, said heating means having a heating member whose heating generating value is larger in the middle portion of said roller than in the end portions of said roller with respect to the longitudinal direction of said roller;

drive means for rotating said heating roller; and

means for rotatably supporting said heating roller, and wherein said heat loss preventing means has an insulating member including a gear of insulating resin fitted to said roller at portion whereat said drive means acts on said

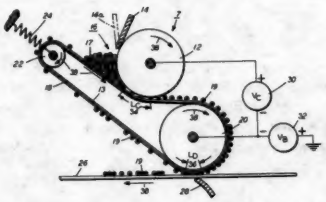
roller, and an insulating member at a portion whereat said supporting means acts on the end portion of said roller.

4,618,241

APPARATUS, PROCESS FOR CHARGING TONER PARTICLES

Dan A. Hays, Fairport, and William H. Wayman, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 286,784, Jul. 27, 1981, Pat. No. 4,459,009. This application Mar. 12, 1984, Ser. No. 588,181
The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.
Int. Cl.⁴ G03G *15/08*
U.S. Cl. 355—3 DD **66 Claims**



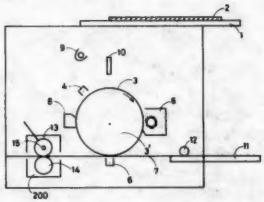
1. An apparatus for charging toner particles containing in operative relationship a rotating means for metering insulating toner particles and a deflected means for transporting and charging insulating toner particles, the means for metering, and the means for transporting being self-spaced by insulating toner particles situated therebetween, said means for metering and said means for transporting biased to a predetermined potential, and wherein the means for transporting contains a triboelectrically active coating thereon.

4,618,242

HEAT FIXING DEVICE FOR A COPYING MACHINE

Toshio Yamagishi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 4, 1984, Ser. No. 678,219
Claims priority, application Japan, Dec. 5, 1983, 58-230091; Dec. 9, 1983, 58-233262
Int. Cl.⁴ G03G *15/20*
U.S. Cl. 355—3 FU **14 Claims**



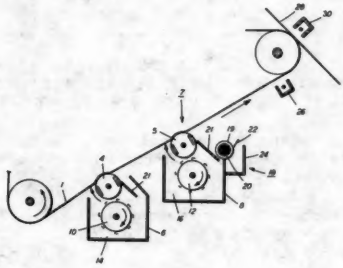
1. A heat fixing device comprising:
fixing means for fixing particles onto a base material by heating;
detecting means for detecting environmental conditions surrounding and/or applied to the fixing means; and
control means responsive to the detecting means, for controlling the speed or number of the base material passing through the fixing means.

4,618,243

APPARATUS FOR COLOR DEVELOPMENT WITH A MAGNETIC SEPARATOR CONTAINING A STATIONARY SHELL WITH ROTATING MAGNETS

John F. Knapp, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 16, 1984, Ser. No. 672,002
Int. Cl.⁴ G03G *15/01, 15/08*
U.S. Cl. 355—4 **10 Claims**



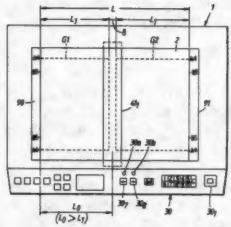
1. An improved apparatus for causing the development of electrostatic latent images of an imaging member consisting essentially of providing a moving deflected flexible imaging member; a moving toner transporting means, a development zone situated between said members, with the distance between the flexible imaging member and the transporting member being from about 0.05 millimeters to about 1.5 millimeters, a first developer reservoir with magnetic developer particles, a second developer reservoir with colored developer particles, and a magnetic separator comprised of a stationary shell with rotating magnets therein.

4,618,244

IMAGE FORMING APPARATUS CAPABLE OF SELECTIVELY OPTICALLY SCANNING ONE OR MORE DOCUMENTS TO BE COPIED DURING ONE SCANNING OPERATION

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 25, 1985, Ser. No. 758,700
Claims priority, application Japan, Sep. 5, 1984, 59-185722
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—8 **7 Claims**



1. An image forming apparatus comprising:
a document table having plural document holding areas capable of holding plural documents selectively placed on respective of said holding areas;
optical scanning means movably provided along said document table to optically scan documents placed on selected of said holding areas;
plural indicating means respectively corresponding to said

plural holding areas provided at the respective holding areas to indicate allowable copy ranges;

designating means for selecting any number of said plural holding areas to be scanned so that any documents placed on said plural holding areas in relation to said respective plural indicating means are scanned;

means for controlling the movement of said optical scanning means to optically scan only the holding areas selected by means of said designating means;

means for producing respective copies of each document placed on a selected holding area selectively scanned by said optical scanning means.

4,618,245

IMAGE FORMING APPARATUS AND ATTACHMENT WHICH TOGETHER ENTER AN ENERGY SAVING MODE

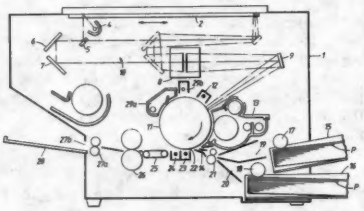
Yukihiro Fukushi, Kawasaki, and Hiroyuki Segawa, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 6, 1985, Ser. No. 730,634

Claims priority, application Japan, May 10, 1984, 59-93192

Int. Cl.⁴ G03G *15/20, 21/00*

U.S. Cl. 355—14 SH **12 Claims**



1. An image forming apparatus with an attachment comprising:

means for forming an image on a recording medium;

means for supplying a first level of electric power for energizing said image forming means for image forming operation;

means for reducing the electric power supplied to said image forming means by said supplying means to a second level lower than the first level so that less electric power is consumed than during said image forming operation;

means for generating a control signal in response to the reduction of electric power supplied to said image forming means; and

control means for maintaining the attachment in an inactive status in response to the control signal.

4,618,246

IMAGE FORMING DEVICE

Nao Nagashima, Tokyo; Koji Suzuki, Yokohama; Jyoji Nagahira, Tokyo; Kouki Kuroda, Yokohama, and Yoshiaki Takayanagi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 661,117, Oct. 15, 1984, Pat. No. 4,573,788, which is a continuation of Ser. No. 284,138, Jul. 16, 1981, abandoned. This application Nov. 6, 1985, Ser. No. 795,420

Claims priority, application Japan, Jul. 22, 1980, 55-100087; Jul. 23, 1980, 55-101657; Jul. 24, 1980, 55-101504

Int. Cl.⁴ G03G *15/00*

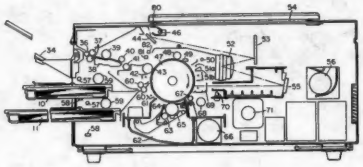
U.S. Cl. 355—14 R **5 Claims**

1. An image forming apparatus comprising:

(a) image forming means for forming an image on a recording member, said image forming means including means for forming the image with different magnifications,

(b) a first control means for detecting an image formation condition and for controlling said image forming means based on the detected condition to form an adequate image, said first control means having a digital memory storing a plurality of control parameters for use in control of said image forming means, and

(c) a second control means for controlling said first control means to provide a different control condition for said image forming means in accordance with the magnification,



wherein said second control means selects a desired one among said plurality of control parameters in accordance with the magnification, and said first control means controls said image forming means in accordance with the detected image formation condition and the selected control parameter.

4,618,247

PHOTORECEPTOR PRE-INITIALIZING ELECTROPHOTOGRAPHIC COPYING MACHINE

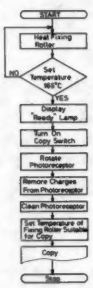
Masaru Tsuji, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 6, 1984, Ser. No. 678,831

Claims priority, application Japan, Dec. 9, 1983, 58-233287

Int. Cl.⁴ G03G *15/20*

U.S. Cl. 355—14 FU **3 Claims**



1. A photoreceptor initialization device in an electrophotographic copying machine, said device comprising:

copy-image forming means for enabling said copying machine to perform a copying operation by providing a toner image onto a copy paper;

heat-fixing means for heat-fixing said toner image onto said copy paper in said copying operation;

means for heating said heat-fixing means to a predetermined toner fixing temperature;

detecting means for determining that said heat-fixing means is being heated prior to said heat-fixing means reaching said predetermined toner fixing temperature;

means for initializing the photoreceptor in response to said detecting means determining that said heat-fixing means is being heated;

said copy-image forming means for enabling said copying machine being activated subsequent to initializing the

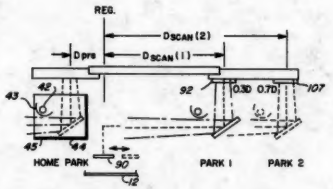
photoreceptor and prior to said heat-fixing means reaching said predetermined toner fixing temperature.

4,618,248

TEST PATCH GENERATION UTILIZING SYSTEM SCAN OPTICS

Wayne A. Buchar, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 18, 1985, Ser. No. 713,530
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R **2 Claims**



1. In an electrophotographic printing machine wherein a document on a support platen is scanned and an image thereof is projected onto a photoreceptor surface, an optical illumination and scanning system adapted to operate in a first and second mode of operation, said system comprising:

means for moving an illumination and scan assembly mounted beneath said platen in a first, document copying, mode from a start of scan to an end of scan to the start of scan position whereby a latent image of the document is formed on the photoreceptor surface,

at least one density target strip affixed to the bottom surface of the platen at a location outside the end of scan position,

said moving means adapted to move said illumination and scan assembly, in a second, test, mode of operation, to a first position outside the start of scan position, said motion occurring coincident with the positioning of an opaque occluder in the optical path to form a dark decay test patch at the photoreceptor surface,

said moving means further adapted to move said illumination and scan assembly from said first position to a second position beneath said target strip, and

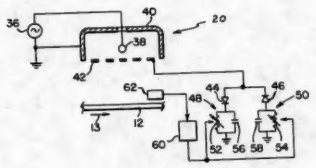
means for selectively and sequentially altering the illumination level directed to said target strip to thereby form test patches of varying density at the photoreceptor surface.

4,618,249

CORONA-CHARGING APPARATUS

James C. Minor, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 10, 1985, Ser. No. 742,828
Int. Cl.[4] G03G *15/02*
U.S. Cl. 355—14 CH **4 Claims**



1. In a corona-charging apparatus for charging an insulating layer wherein the apparatus includes a conductive control grid, at least one corona-emitting electrode, and a power supply to the electrode, the improvement comprising:

a variable impedance;

circuit means, without an active power supply to the grid, for sinking current from the grid through said variable impedance;

means for sensing the charge in the insulating layer; and

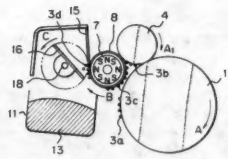
control means responsive to said sensing means for adjusting the value of said variable impedance to maintain said charge at a predetermined level.

4,618,250

PHOTOSENSITIVE DRUM CLEANING DEVICE IN ELECTROPHOTOGRAPHIC RECORDING SYSTEM

Matsusaburo Noguchi; Mikio Yamamoto, and Tetsuji Kojima, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 10, 1985, Ser. No. 742,965
Claims priority, application Japan, Jun. 11, 1984, 59-118216
Int. Cl.[4] G03G *21/00*; A47L *13/40*; B60S *1/28*
U.S. Cl. 355—15 **6 Claims**



1. A photosensitive drum cleaning device in an electrophotographic recording system, comprising:

a photosensitive drum for attracting magnetic toner to the peripheral surface thereof and transferring the magnetic toner to paper;

a cleaning roll contacting said drum for wiping excess magnetic toner off of said surface of said drum;

means, comprising a rotatable cylindrical device including a rotatable cylindrical permanent magnet, for carrying the toner wiped off of said surface of said drum on a peripheral surface of said cylindrical device under the magnetic forces of said permanent magnet;

a scraper making contact with said peripheral surface so as to block the toner carried on said peripheral surface; and

means for removing toner accumulated at a point of contact between said scraper and said peripheral surface, said removing means including a rotary blade formed of magnetic material, rotatable to pass sufficiently close to said point of contact between said peripheral surface and said scraper to scrape off the toner blocked by said scraper and carry away the toner with the toner held to said blade by magnetic attraction.

4,618,251

RECORDING APPARATUS

Hitoshi Yanagawa, Tokyo; Takeshi Nagasawa; Shunzo Inoue, both of Yokohama; Toshio Iwaya, Shiki, and Shinji Murata, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 421,736, Sep. 23, 1982, abandoned. This application Oct. 5, 1984, Ser. No. 658,072
Claims priority, application Japan, Oct. 5, 1981, 56-158482; Oct. 5, 1981, 56-158483; Oct. 5, 1981, 56-158484
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—28 **1 Claim**

1. A recording apparatus for recording an image on an elongate web comprising:

exposure means for exposing an image on said web;

developing means for developing the exposed web;

a web storage chamber disposed between said exposure

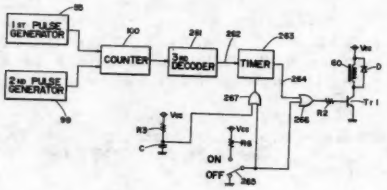
means and said developing means for storing in loop form the web fed from said exposure means;

feeding means for feeding the web from said web storage chamber to said developing means;

operating means for initiating operation of said developing means;

timer means arranged for actuation when the amount of web in said web storage chamber has reached a predetermined amount so as to generate a timing signal a predetermined interval after actuation, wherein said timer means is reset to prevent generation of the timing signal if said operating means initiates opertion of said developing means before passage of the predetermined interval; and

control means for controlling said feeding means such that the web in said web storage chamber is fed to said developing means either in response to the initiation of operation of said developing means or in response to the timing signal.



4,618,252

COPYING MACHINE WITH A VARIABLE MAGNIFICATION DEVICE

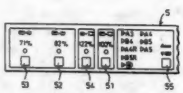
Masahiko Hisajima, Ikoma; Yutaka Shigemura, Takarazuka; Yoshinori Makiura, Tondabayashi, and Mitsuya Ishito, Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

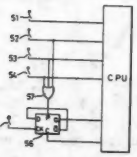
Filed Mar. 22, 1985, Ser. No. 714,745

Claims priority, application Japan, Mar. 27, 1984, 59-60241

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—55 **5 Claims**





1. A copying machine which has a variable magnification device and is operable in a variable magnification copying mode, comprising two paper cassettes mounted in a drawable manner in vertically spaced relation so that there is an upper cassette and a lower cassette, wherein a desired paper cassette can be selected by a select key for the paper cassette as the source of copying paper for the machine, characterized in that there are provided

a detection means for detecting when said variable magnification copying mode has been selected, said detection means being operable to provide a signal when said variable magnification copying mode has been selected, and,

a cassette selection means for selecting an upper paper cassettte as the source of the copying paper, said selection means being operable automatically to select the upper cassette in response to said signal from the detection means showing that the variable magnification copying mode has been selected.

4,618,253

FOCAL POSITION ADJUSTING DEVICE FOR SMALL VARIABLE-MAGNIFICATION TYPE COPYING MACHINE WITH ZOOM LENS

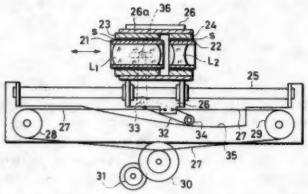
Yasunori Arai, Tokyo, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Mar. 27, 1985, Ser. No. 716,433

Claims priority, application Japan, Apr. 16, 1984, 59-76386

Int. Cl.[4] G03B *27/34, 27/40, 27/70*

U.S. Cl. 355—57 **4 Claims**



1. A small zoom-lens operated variable-magnification type copying machine comprising: a reciprocating original holding stand; a first mirror for reflecting the image of an original on said stand; an second mirror for reflecting towards a photosensitive drum a light beam reflected from said first mirror, said first and second mirrors being arranged below said original holding stand; and a zoom lens disposed between said first and second mirrors, said zoom lens including at least two lens groups arranged along the optical axis; zooming means for moving said zoom lens to perform a zooming operation and position adjusting means for adjusting the positions, in the direction of the optical axis, of said at least two lens groups in said zoom lens during assembly of said copying machine independently of said zooming operation.

4,618,254

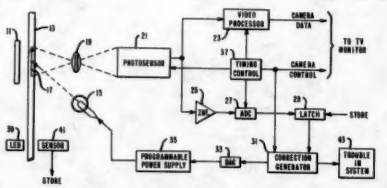
AUTOMATIC LIGHT CONTROL SYSTEM

Roger H. Therrien, Waterloo, and Maninderpal S. Chahal, Kitchener, both of Canada, assignors to NCR Canada Ltd, Mississauga, Canada

Filed Oct. 15, 1982, Ser. No. 435,014

Int. Cl.[4] G03B *27/78*

U.S. Cl. 355—68 **2 Claims**



1. An automatic light intensity control system for a light source located adjacent a pathway along which an object having a light reflecting surface is moved, said system comprising:

a reference background located adjacent the pathway for reflecting light impinging thereon from the light source;

sensing means positioned adjacent the pathway and adapted to output a first control signal upon movement of an object along said pathway before it reaches said reference background;

a photsensor positioned adjacent said pathway,

a lens for focusing light reflected from said reference background or from the surface of said object onto said photosensor, said photosensor being responsive to this focused reflected light for producing an electrical signal which is proportional to the reflected light received from the reference background or the light reflecting surface of the object;

an integrator coupled to said photosensor for averaging the electrical signal received from said photosensor over a preselected period of time to develop a first analog signal;

an analog-to-digital converter coupled to said integrator for converting the first analog signal into a first digital signal;

a storage member coupled to said analog-to-digital converter and said sensor means, said storage member enabled by said first control signal to store the first digital signal outputted by said analog-to-digital converter thereby terminating the preselected period of time;

means coupled to said storage member for comparing the first digital signal with a digital reference signal to generate a second digital signal;

a digital-to-analog converter coupled to said comparing means for converting the second digital signal into a second analog signal;

and an analog programmable power supply coupled between said light source and the digital to analog converter for receiving such second analog signal enabling the power supply to change the voltage applied to the light source as a function of the amplitude of the second analog signal.

4,618,255

PROCESS CAMERA APPARATUS

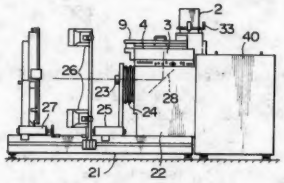
Eiji Miyasaka; Iwao Hirose, both of Hikone; Koji Yamashita, Omihachiman; Kenji Kawai, Hikone, and Eiji Kanada, Nagaokakyo, all of Japan, assignors to Dainippon Screen Mfg., Co., Ltd., Kyoto, Japan

Filed Jun. 17, 1985, Ser. No. 745,641

Claims priority, application Japan, Jun. 18, 1984, 59-126209; Jun. 18, 1984, 59-126210; Jun. 18, 1984, 59-91415[U]

Int. Cl.[4] G03B *27/72*

U.S. Cl. 355—71 **10 Claims**



1. A process camera apparatus comprising:

a base;

a transparent platen provided on said base;

a light-shielding means covering the upper side of said transparent platen such as to form a light-shielded region on said transparent platen;

a screen means including a contact screen and a supporting means for supporting said contact screen, said screen means being withdrawably disposed on the portion of said transparent platen within said light-shielded region;

a conveyor means disposed adjacent one end of said base and adapted for conveying said photosensitive material into said light-shielded region; and

a light-shielded condition maintaining means adapted to maintain the light-shielded condition in said light-shielded region when said screen means is being taken out from said light-shielded region,

said light-shielding means including a light-shielding frame having a light-shielding cover sheet, said light-shielding frame being pivotable between an open position and a closing position in which said light-shielding frame covers the upper side of said platen such as to form said light-shielded region on said platen.

4,618,256

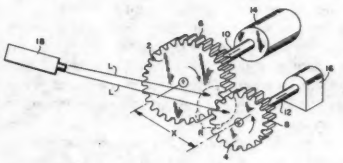
STROBOSCOPIC METHOD FOR DETERMINING GEAR MESH QUALITY

Mark E. Bartolomeo, Vernon, Conn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 12, 1985, Ser. No. 722,477

Int. Cl.[4] G01P *3/40*; G03B *1/00*

U.S. Cl. 356—23 **3 Claims**



1. A stroboscopic method of determining gear mesh quality, said method including the steps of:

(a) mounting at least two gears of a given type for rotation in meshed engagement between the respective teeth thereof predetermined to provide the degree of mesh engagement quality desired therefor for a predetermined rpm of said gears,

(b) providing means for rotating one of the gears of step (a) at the predetermined rpm,

(c) providing a stroboscope light source having an adjustable pulse rate for a light beam emitted therefrom,

(d) rotating the gear of step (b) at the predetermined rpm,

(e) adjusting the pulse rate of the light beam of step (c) to substantially match the gear rpm of step (d),

(f) directing the light beam of step (e) at a region encompassing the meshed engagement between the respective teeth of the gears of step (a) in a direction predetermined to establish a visible light refractance interference pattern for said gears depicting the standard of mesh engagement quality characteristic thereof,

(g) recording the standard pattern established in step (f),

(h) replacing at least one of the gears of step (a) with a gear of the same type,

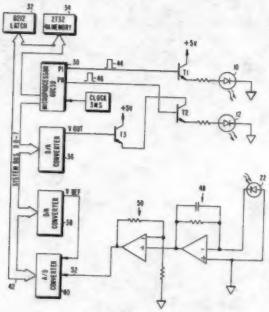
(i) repeating steps (d) through (f) at the predetermined rpm and without changing the direction of the light beam to provide a light refractance interference pattern characteristic thereof,

(j) comparing the pattern of step (i) to the established standard pattern of step (g) to determine the gear mesh quality of the gears of step (h).

4,618,257
COLOR-SENSITIVE CURRENCY VERIFIER

Robert T. Bayne, Carmel, and James E. Heidelberger, Indianapolis, both of Ind., assignors to Standard Change-Makers, Inc., Indianapolis, Ind.

Filed Jan. 6, 1984, Ser. No. 568,586
Int. Cl.[4] G01J *3/50*; G06K *5/00*; G08B *21/00*
U.S. Cl. 356—71 **20 Claims**



19. A color-sensitive currency verifier, comprising:

(a) projecting means for sequentially projecting light of first and second wavelengths onto a test area of a specimen bill placed in said currency verifier for verification, said projecting means including means for projecting light of one of said wavelengths onto a predetermined reference area of the bill indicative of bill condition;

(b) detection means coupled to said projecting means for detecting light received from said test area and said reference area, said detection means including

(1) means for generating a reference signal proportionate to the intensity of light received from said reference area; and

(2) means for generating first and second test signals respectively proportionate to the intensity of light of said first and second wavelengths received from said test area;

(c) variable-gain means for generating first and second normalized signals respectively proportionate to said first and second test signals, said variable-gain means including a gain control input;

(d) processing means for deriving a gain control signal from said reference signal, said processing means having an output coupled to said gain control input, whereby the gain of said variable-gain means is varied in response to the condition of the bill; and

(e) means for determining the authenticity of the specimen bill based upon the difference between said first and second normalized signals.

4,618,258
METHOD FOR MEASURING LOOP COUPLING EFFICIENCY

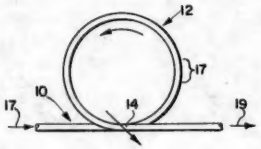
John W. Hicks, Jr., Northboro, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 3, 1984, Ser. No. 637,478
Int. Cl.[4] G01N *21/84*
U.S. Cl. 356—73.1 **10 Claims**

1. A method for determining the light energy transfer characteristic of a selected optical path in a multipath optical fiber network in which the optical fibers include a light energy transmitting core and a cladding having an index of refraction less than that of the core, the network including an exit port and at least a pair of fibers coupled together such that light energy is fed from both said fibers to the exit port, said method comprising the steps of:

determining the characteristics of the light energy output at the exit port;

interrupting the transmission of light energy in the core of one of the selected optical fibers by effecting a change in the boundary conditions at least adjoining the core to



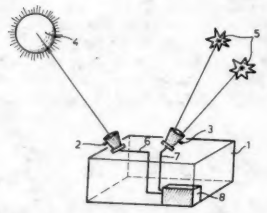
cladding interface of one fiber sufficient to cause the light energy in the core to escape the core; and

redetermining the characteristics of the light energy output at the exit port and comparing the redetermined characteristics with the first-determined characteristics.

4,618,259
STAR AND SUN SENSOR FOR ATTITUDE AND POSITION CONTROL

Reinhard Czichy, Ottobrunn, and Wilhelm Goeschel, Taufkirchen, both of Fed. Rep. of Germany, assignors to MBB GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,358
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412046
Int. Cl.[4] G01B *11/26*; G01C *1/00*; F41G *1/38*
U.S. Cl. 356—152 **4 Claims**



1. A combined sun and star sensing system for attitude and position control of a space vehicle, comprising:

a star image sensor, including a first objective lens or lens system having a focal and image plane, there being a first detector array arranged in said image plane;

said objective or objective lens system being constructed for a well defined aberration so as to convert a point like object into a defined spot or area having a diameter larger than the diameter of an element of said first detector array;

a sun sensor including a second objective lens or lens system having an image and focal plane, there being a second detector array being arranged in the image plane of said second objective of the sun sensor;

said first and second detector arrays having similar and a similar number of detector elements;

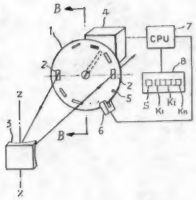
a single evaluating electronic for detector array images; and

switching means for selectively connecting said first and said detector array to said evaluating electronic.

4,618,260
SLIT CHANGING DEVICE FOR MONOCHROMATOR

Kunihiko Okubo, Moriyama, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Oct. 28, 1983, Ser. No. 546,527
Claims priority, application Japan, Oct. 30, 1982, 57-191582
Int. Cl.[4] G01J 3/18
U.S. Cl. 356—331 2 Claims



1. A slit positioning system for a monochromator including a diffraction grating comprising:

(a) slit disc means having a plurality of spaced pairs of slits, each pair including a light-incident slit for directing light onto said grating and a light-ejection slit for receiving light diffracted by said grating, the slits of each pair being of the same width and being diametrically disposed on the slit disc means, the slit widths of the respective pairs being different from each other, each slit pair having a slit number corresponding to a predetermined address on said slit disc means with respect to a positive direction of rotation of the slit disc means;

(b) stop apertures provided in said slit disc means for each slit pair having aperture widths inversely proportional to the slit widths of the associated slit pairs;

(c) means for directing light passing through the light-ejection slits back through the associated stop aperture;

(d) photodetector means for measuring the intensity of light passed back through said stop aperture;

(e) pulse motor means coupled to said slit disc means for rotating said slit disc means in either said positive direction or a negative direction to position a slit pair of a selected slit number into optical alignment with the diffraction grating;

(f) means for determining the slit number of the present slit pair in optical alignment with the diffraction grating;

(g) keyboard means for selecting a slit number of a new slit pair to be positioned by said pulse motor means in optical alignment with said diffraction grating;

(h) means for comparing the new slit number with the present slit number and generating a positive drive signal when the new slit number is greater than the present slit number and a negative drive signal when the new slit number is smaller than the present slit number; and

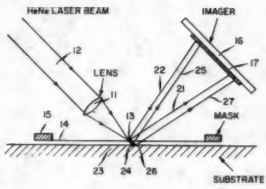
(i) control means for driving said pulse motor means in a positive direction in response to said positive drive signal and in a negative direction followed by said positive direction in response to said negative drive signal to position said new slit pair in optical alignment with said diffraction grating;

whereby the final direction of rotation which achieves the positioning of said new slit pair is always in said positive direction.

4,618,261
OPTICAL GAP MEASURING

Dale C. Flanders, Lexington, and Theodore M. Lyszczarz, Concord, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 16, 1984, Ser. No. 570,918
Int. Cl.[4] G01B 9/02
U.S. Cl. 356—357 13 Claims



1. Gap measuring apparatus for indicating the gap between a mask and substrate comprising,

said mask,

said substrate,

a source of collimated optical energy,

means for focusing said optical energy upon said mask and directing some of said optical energy through said mask upon said substrate,

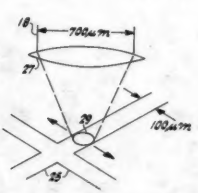
imaging means for receiving said optical energy reflected from said mask and from said substrate through said mask,

some of the focused energy being reflected from said mask and some from said substrate after passing through said mask to form an interference pattern on said imaging means of spatial frequency representative of the gap distance between said substrate and said mask.

4,618,262
LASER INTERFEROMETER SYSTEM AND METHOD FOR MONITORING AND CONTROLLING IC PROCESSING

Dan Maydan, Los Altos Hills; Sasson Somekh, Redwood City, and Edward M. Kaczorowski, Santa Clara, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Apr. 13, 1984, Ser. No. 600,189
Int. Cl.[4] G01B 11/02, 9/02
U.S. Cl. 356—357 25 Claims



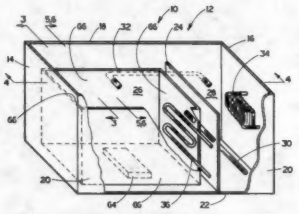
1. A process for monitoring the change in thickness of a layer of material being fabricated on a substrate as by one of etching, growth or deposition, based upon the change in thickness of the layer on a substrate scribe line or other selected feature, comprising focusing a laser beam to a beam spot on the substrate, the focused beam spot being of a small size selected based upon the size of the selected feature, for providing an enhanced signal-to-noise ratio; repetitively scanning the beam spot across the selected feature to generate an optical interference signal characteristic of the repetitive scanning and the thickness of the selected substrate feature; and converting the optical signal into a corresponding electrical signal adapted for monitoring the fabrication process.

4,618,263

SOUND SUPPRESSOR IN A LIQUID MEDIUM

James W. McCord, 9101 Northingham Pkwy., Louisville, Ky. 40222

Continuation-in-part of Ser. No. 421,077, Sep. 22, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 670,865
Int. Cl.[4] B01F *11/02*
U.S. Cl. 366—127 7 Claims



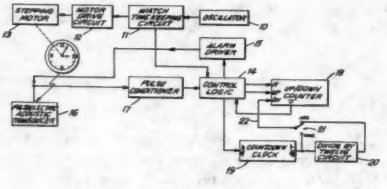
1. An apparatus for agitating a liquid comprising:
a housing defining at least one chamber for containing the liquid;
cavitation generating means disposed within said at least one chamber for agitating the liquid contained in said at least one chamber;
wave reflecting means disposed within said at least one chamber, said wave reflecting means including reflecting surface means located to reflect waves from generally the margin of said at least one chamber back into the body of the liquid contained in said at least one chamber to reinforce cavitation of the liquid in the chamber created by the cavitation generating means as the energy of the reflected waves is dispated in the liquid;
sound suppressing, means disposed between said wave reflecting means and at least one wall of said at least one chamber to suppress or absorb the waves not reflected back into the liquid in the at least one chamber by the wave reflecting means.

4,618,264

ACOUSTIC ALARM SETTING DEVICE FOR A TIMEPIECE

Bruce H. Kamens, Thomaston, and George E. Ritter, Southbury, both of Conn., assignors to Timex Corporation, Waterbury, Conn.

Filed Sep. 25, 1985, Ser. No. 780,134
Int. Cl.[4] H01H *43/00;* G04C *9/08*
U.S. Cl. 368—74 13 Claims



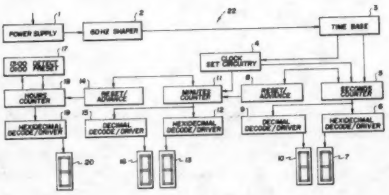
1. In an electronic timepiece having a timekeeping ciruit providing timing pulses and display-actuating means moving at least one hand indicating passage of time, and having an alarm including a piezoelectric transducer and an alarm for producing an alarm sound, an improved alarm setting device comprising:
a rotatable ring mounted on said timepiece having an indicia for aligning with said hand in a first rotated position,
acoustic means associated with said ring producing a plurality of clicks of preselected acoustic level to said transducer when said ring is rotated to a second rotated position,
a pulse conditioning circuit connected to said transducer and providing a pulse for each click,
first counting means counting the number of pulses corresponding to the number of clicks between said first and second rotated positions, and
logic means connected to said timekeeping circuit and arranged to actuate said alarm after passage of an elapsed time which is proportional to the number of counted pulses.

4,618,265

HEXIDECIMAL CLOCK, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Richard A. Wadowski, 33281 Karin Dr., Apt. 205, Sterling Heights, Mich. 48077

Filed Dec. 20, 1985, Ser. No. 811,728
Int. Cl.[4] G04C *19/00, 15/00*
U.S. Cl. 368—82 21 Claims



1. A hexidecimal time display apparatus, comprising:
a power supply;
first means for generating a timebase from said power supply operably connected thereto;
second means for detecting changes in time in seconds operably connected to said first means;
third means for counting seconds operably connected to said second means;
fourth means for counting minutes operably connected to said third means;
fifth means for counting hours operably connected to said fourth means;
sixth means for continuously resetting or advancing said third, fourth and fifth means a predetermined amount at a predetermined time operably connected thereto;
seventh means for converting the magnitude of said third, fourth and fifth means into at least three hexidecimal coded signals; and
a plurality of displays to show the hexidecimal signals of said seventh means.

4,618,266

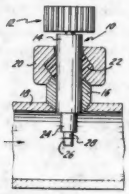
MEASUREMENT OF ENERGY IN FLOWING FLUID

Murray F. Feller, Citrus County, Fla., assignor to Wilgood Corporation, Dunnellon, Fla.

Filed Jun. 3, 1983, Ser. No. 501,009
Int. Cl.[4] G01K *17/06*
U.S. Cl. 374—41 26 Claims

1. Apparatus for providing a measurement of the energy in steam or the like converted from liquid to vapor by heating and transmitted to a vapor-condensing load, said apparatus including:
i. a probe,
ii. a vapor-supply conduit for the load, and
iii. read-out means for providing a measure of the latent heat and other factors in be energy in the vapor flowing along the supply conduit,
said probe including a heat transmitter that is elongated and

includes a portion protruding inward into the supply conduit, at least a segment of the length of the heat transmitter being a linear thermal impedance of high thermal conductivity, a sensing tip constituting part of said heat transmitter and limited to a small portion of the inward protruding portion thereof, the comparatively much larger remainder of said inward protruding portion of the heat transmitter being covered with thermal insulation, said sensing tip being spaced substantially from the inner surface of the supply conduit and being exposed to the vapor in said conduit, a heat absorber at the end of the heat transmitter remote from the sensing tip, said heat absorber having at least such capacity and the heat transmitter having such limited thermal impedance and the sensing tip having such limited exposed area in relation to one another as to maintain the temperature of the sensing tip well below the condensation point of the vapor at the maximum rate of energy transmission and flow of vapor to be monitored, and first and second temperature sensors spaced apart along said linear thermal impedance, said second sensor being farther than said first sensor from the sensing tip,



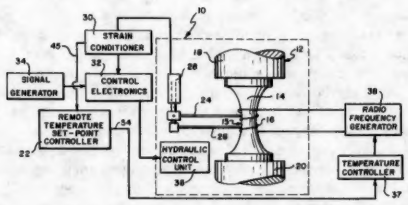
said sensros being connected to said read-out means for providing input representing the temperature difference between the sensors, and said read-out means being calibrated to provide a measure of energy trnasmission along the conduit.

4,618,267

REMOTE TEMPERATURE-SET-POINT CONTROLLER

William F. Burke, Crest Hill, and Alan L. Winiecki, Downers Grove, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 17, 1984, Ser. No. 661,843
Int. Cl.[4] G01N *3/18*
U.S. Cl. 374—50 **10 Claims**



1. A temperature control system for an instrument for providing mechanical strain data in a fully reversed cycle test on a metallic sample with the strain results being minimum and maximum values, the system comprising

temperature means coupled to said sample for varying the temperature of the sample during the test including a set point means in a controlled device corresponding to a controlled temperature,

means coupled to said sample for determining the value of strain during the test and providing an output signal representative of strain, and

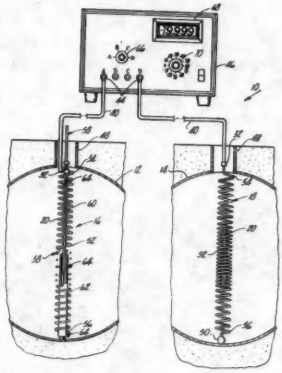
circuit means interconnected between the strain output and set point means for changing the set point linearly with changing values of strain output.

4,618,268

METHOD AND APPARATUS FOR SENSING AVERAGE TEMPERATURE

John A. Horner, 211 E. Grove St., Kawkawlin, Mich. 48631

Filed Jan. 9, 1985, Ser. No. 691,410
Int. Cl.[4] G01K *3/06*
U.S. Cl. 374—115 **16 Claims**



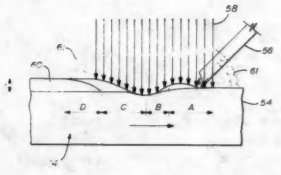
1. A temperature averaging sensor for measuring the average temperature of a fluid confined within a tank having a nonuniform depth-volume profile comprising, in combination: a length of wire with a known electrical resistance versus temperature characteristic; an extensible cylindrical, multiturn helical coil of plastic tubing in which said length of wire is contained; means for extending said coil to a predetermined length corresponding to the depth of fluid within said tank and means for arranging the spacing between coil turns so that the density of coil turns is commensurate with the depth-volume profile of the liquid in said tank; and an electrical connector connected to each end of said wire and adapted to be connected to a measuring circuit.

4,618,269

HARDENED BEARING SURFACE AND METHOD OF FORMING SAME

Robert P. Badrak, Missouri City, and Terry H. Mayo, Houston, both of Tex., assignors to Reed Tool Company, Houston, Tex.

Filed Sep. 18, 1985, Ser. No. 777,279
Int. Cl.[4] F16C *17/10*
U.S. Cl. 384—95 **9 Claims**



1. In a component for a rotary cutter rock bit having a base material formed of a low alloy low carbon steel base material with a Rockwell C hardness less than forty-five (45) and an annular bearing thereon;

a hardened alloyed bearing ring defining the outer surface of said bearing and having a thickness of between 0.005 inch and 0.125 inch;

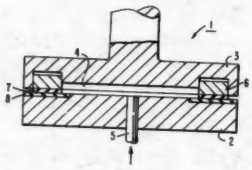
said hardened alloy bearing ring being a composite mix of an alloy material and the adjacent steel base material of said component formed from a combination of melted alloy material and base material consisting of at least 10 percent of the base material and less than 90 percent of the alloy material for fusibly bonding the alloy and base materials, said hardened alloyed bearing ring having a Rockwell C hardness of at least forty-five (45).

4,618,270

HYDROSTATIC BEARING STRUCTURE

Charles E. Kraus, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Mar. 4, 1985, Ser. No. 708,029
Int. Cl.[4] F16C *17/00, 27/02*
U.S. Cl. 384—114 **10 Claims**



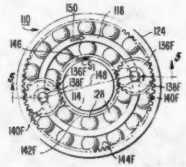
1. A hydrostatic bearing structure comprising two bearing members disposed so as to be movable relative to one another and having adjacent one another bearing surfaces adapted to accommodate therebetween a bearing fluid under pressure for supporting one of said members on the other, the bearing surface of at least one of said members being formed by a thin layer of an elastomeric material disposed on a substrate of a highly heat conductive material, said layer of elastomeric material having a thickness of not more than 1/32 inch for rapid travel of heat generated at said bearing surface area into said substrate.

4,618,271

SERIAL BEARING ASSEMBLY

Paul Z. Li, Tallahassee, Fla., assignor to Florida State University, Tallahassee, Fla.

Filed Dec. 11, 1985, Ser. No. 807,659
Int. Cl.[4] F16C *19/08*
U.S. Cl. 384—461 **30 Claims**



1. A serial bearing assembly comprising:

(a) a first member having a first bearing surface;

(b) a second member having a second-bearing surface, said first member being movable relative to said second member;

(c) an intermediate member movable relative to said first member and movable relative to said second member, said intermediate member having a first intermediate bearing surface facing said first bearing surface and a second intermediate bearing surface facing said second bearing surface;

(d) first bearing means between said first bearing surface and said first intermediate bearing surface to allow relative movement between said first bearing surface and said first intermediate bearing surface;

(e) second bearing means between said second bearing surface and said second intermediate bearing surface to allow relative movement between said second bearing surface and said second intermediate bearing surface; and

(f) speed distribution means connected to said first member, said second member, and said intermediate member and operable such that movement of said first member in a given direction at a given speed relative to said second member will drive said speed distribution means which causes said intermediate member to move in said given direction at a fraction of said given speed relative to said second member; and

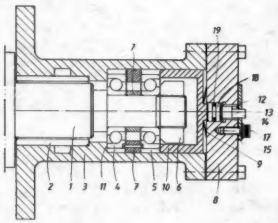
wherein said speed distribution means includes a first wheel drivingly engaged to said first member and said second member and pivotably mounted to said intermediate member.

4,618,272

DEVICE FOR FIXING A THRUST BEARING

Paul Lindström, Norrköping, Sweden, assignor to Stal Refrigeration AB, Norrköping, Sweden

Continuation of Ser. No. 664,417, Oct. 24, 1984, abandoned.
This application Jan. 16, 1986, Ser. No. 819,010
Claims priority, application Sweden, Oct. 26, 1983, 8305875
Int. Cl.[4] F16C *23/06, 25/06;* **F16D** *3/00;* **F16B** *39/10*
U.S. Cl. 384—517 **7 Claims**



1. A machine which includes a rotatable shaft that has a roller bearing positioned around one end thereof, said rotatable shaft defining a central axis therethrough; a housing in which said roller bearing is rotatably positioned, said housing including a support surface against which said roller bearing can be positioned and an open end which lies along said central axis; a cover plate which is mounted on said housing to cover said open end thereof, said cover plate including a threaded hole which extends therethrough in parallel with said central axis; a generally cup-shaped spacing sleeve positioned within said housing between said cover plate and said roller bearing, said generally cup-shaped spacing sleeve having an open end which faces said roller bearing; a threaded fixing member which is engaged in said threaded hole in said cover plate and is capable of moving said generally cup-shaped spacing sleeve towards said roller bearing so as to restrict the movement of said roller bearing within said housing in parallel with said central axis, said threaded fixing member including an inner end which faces said generally cup-shaped spacing sleeve and an outer end which is located externally of said cover plate; and a resilient member located within said housing between said cover plate and said generally cup-shaped spacing sleeve to bias said generally cup-shaped spacing sleeve towards said roller bearing and thus move said roller bearing against said support surface yet allow movement of said roller bearing within said housing transversely to said central axis.

4,618,273

STEP BEARING FOR A SPINNING ROTOR SHAFT

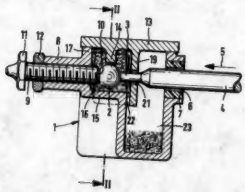
Dieter Götz, Geislingen, and Werner Zott, Donzdorf, both of Fed. Rep. of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Nov. 12, 1985, Ser. No. 796,792

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3440950

Int. Cl.[4] F16C *19/50*

U.S. Cl. 384—606 26 Claims



1. A step bearing for supporting a spinning rotor shaft comprising:

a bearing housing means for accommodating an end of a spinning rotor shaft;

a ball means guidable by a guide means and supporting an end of said shaft means, in said housing means;

lubricant supply means for continuously supplying lubricant to said ball means, including a container means for holding lubricant around the circumference of the ball means, wherein said ball means is disposed in said container means, said container means being trough-shaped and filled with lubricating grease.

4,618,274

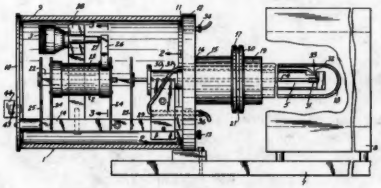
DILATOMETER HOUSING

Gerhard R. Clusener, 112 Reni Rd., Manhasset, N.Y. 11030

Filed Apr. 16, 1984, Ser. No. 600,892

Int. Cl.[4] G01K *1/08;* G01N *25/00*

U.S. Cl. 374—208 18 Claims



9. Encased dilatometer comprising

(a) a dilation sensor mounted on an elongated attachment beam,

(b) a tubular fixed specimen holder having an open end and a closed end that is internally adapted to abut a flat surface of a specimen, said specimen holder being held adjacent its open end by a clamp mounted on said attachment beam,

(c) a movable pushrod that is coupled at one end to said sensor and at the outer end is adapted to abut a second parallel flat surface on said specimen, said pushrod extending into the open end of said tubular fixed specimen holder,

(d) a tubular sleeve encircling said attachment beam, sensor and clamp,

(e) a cover closing and hermetically sealing a first end of said sleeve distal to said clamp, said cover being attached to an end of said attachment beam,

(f) a ring shaped plate closing and hermetically sealing a second end of said sleeve and being demountably coupled to an oppoiste end of said attachment beam to adjustably lock said cover to said sleeve and to permit said cover and sensor attachment beam to be removed as a unit, said plate containing a vacuum port and having a connecting tube extending for a rim of a circular aperture of said plate on a side of said plate opposite said connecting tube terminating in a first flange at an open end and said sleeve,

(g) a protective tube having open and closed ends and a second flange at said open end which is demountably clamped and hermetically sealed to said first flange, said specimen holder extending loosely through said aperture and connecting tube into the open end of sid protective tube.

4,618,275

METHOD FOR RESETTING THE PRINTING HEAD OF A TYPEWRITER

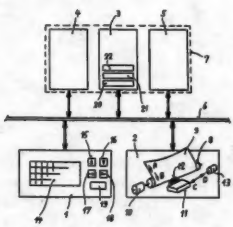
Gerhard Brinkmann, Schortens, and Bolko Wietrzynski, Wilhelmshaven, both of Fed. Rep. of Germany, assignors to Olympia Werke AG, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,422

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1984, 3410505

Int. Cl.[4] B41J *11/42*

U.S. Cl. 400—76 3 Claims



1. The method for resetting the printing head of a processor-controlled typewriter to the end of a text printed on an inserted recording medium through initiation of an automatic reset function after a preceding positioning of the printing head to another position, said method comprising the steps of:

storing the current horizontal position of the printing head and of the last character of the printed text;

developing signals corresponding to the steps of vertical movement of the recording medium, said signals having a positive or negative characteristic sign corresponding to the direction of upward and downward movements;

adding said signals and storing the sum thereof, said sum indicating the number of steps of vertical movement of the record media;

cancelling the stored number of steps of upward movement of the recording medium upon initiation of a character impression;

retaining the stored number of steps of downward movement upon initiation of a character impression;

upon initiation of a reset function, evaluating the stored number of steps for controlling a movement of the recording medium in accordance with the characteristic directional sign indicating the relative position to the last printing line;

evaluating the difference between the stored horizontal position of the printing head and the last character typed for controlling the horizontal repositioning of the printing head leftwardly and rightwardly as dictated by said difference to the last blank printing position behind the last character.

4,618,276

DOT MATRIX PRINT HEAD

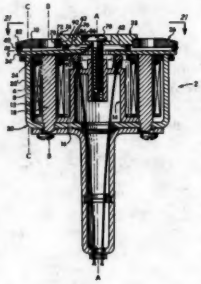
James E. Blomquist, and Robert H. Wilczewski, both of 1130 Major Ave., both of Riverton, Wyo. 82501

Continuation-in-part of Ser. No. 616,792, Jun. 1, 1984, Pat. No. 4,587,724, which is a division of Ser. No. 499,208, May 31, 1983, abandoned, which is a division of Ser. No. 425,255, Sep. 28, 1982, Pat. No. 4,401,392, which is a continuation of Ser. No. 256,032, Apr. 21, 1981, abandoned, which is a division of Ser. No. 38,724, May 14, 1979, Pat. No. 4,279,518. This application Dec. 10, 1984, Ser. No. 679,928

Int. Cl.[4] B41J *3/12*

U.S. Cl. 400—124

23 Claims



1. In a dot matrix print head having a central axis, a plurality of pole pieces extending along respective axes and mounted about said central axes, and a plurality of coil assemblies, each coil assembly including at least a clapper member and a coil member positioned about a respective pole piece, the improvement including:

means for mounting the clapper member of each respective coil assembly for movement relative to a respective pole piece between at least first and second positions, said mounting means including a cover member and an annular backstop member, said cover member having a central axis and means for retaining said backstop member in said cover member with said backstop member extending about the central axis of said cover member, said mounting means further including means for positioning said backstop member within said retaining means relative to the central axis of said cover member, said retaining means including a plurality of finger members radially spaced from each other about the central axis of said cover member, and said positioning means including a cap member having a central axis and a plurality of finger members extending substantially outwardly of and being radially spaced from each other about the central axis of said cap member, the respective radial spacing of the finger members of said cover member and said cap member about the respective central axes of said cover member and cap member substantially corresponding wherein said positioning means further includes means for securing said cap member in a first position relative to said cover member with the respective axes thereof substantially aligned and with at least first portions of each finger member of said cap member being received between portions of at least two finger members of said cover member and contacting said backstop member, and means for biasing each clapper member against said backstop member to define the respective second position thereof.

4,618,277

PRINT HEAD

Kiyomitsu Asano, Tokyo, and Toshikatsu Kondo, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya and Nippon Telecommunication Engineering Company, Tokyo, both of, Japan

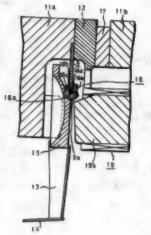
Continuation of Ser. No. 548,355, Nov. 3, 1983, abandoned. This application Oct. 17, 1985, Ser. No. 789,342

Claims priority, application Japan, Nov. 18, 1982, 57-175142[U]

Int. Cl.[4] B41J *3/12*

U.S. Cl. 400—124

3 Claims



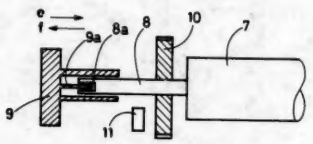
1. A print head arrangement mounted on a dot matrix printer of an impact type, comprising a plurality of armatures (15), each connected fixedly at one end thereof to a print wire (14), said print wire (14) and said armature (15) being movable during printing operation; and electromagnetic device (19) disposed at a position corresponding to each of said armature (15) to drive a corresponding armature (15) and print wire (14) connected thereto selectively for printing operation; a holding part (16) connected to the other end of each said armature (15); and rigid resilient spring plate (9) fixed at one end thereof (9*a*) to said holding part (16) and held fixedly in a frame (11*a*) another end thereof; wherein said holding part (16) comprises a single unitary structure comprising a body portion connected to said other end of said armature, one arm portion (16*b*), another arm portion (16*c*), said body portion connecting said one arm portion and said other arm portion, and a recess (16*a*) formed by said one arm portion (16*b*), said other arm portion (16*c*) and said body portion for holding said one end (9*a*) of said spring plate therein, wherein said one arm portion (16*b*) extends from said body portion away from said armature and perpendicularly toward said frame (11*a*) in an unbent state and contiguously on one side of said spring plate, said one side of said spring plate being subjected to a compressive stress when said spring is bent in a predetermined direction during print operation, and is longer than said other arm portion (16*c*), and wherein said other arm portion (16*c*) extends from said body portion away from said armature and perpendicularly towards said frame (11*a*) in an unbent state and contiguously on another side of said spring plate, said other side of said spring plate is being subjected to a tensile stress when said spring plate is bent in said predetermined direction (arrow) during point operation, said spring plate (9) and said one arm portion (16*b*) and said other arm portion (16*c*) being joined together by brazing (18*a*, 18*b*) at ends opposite said body portion, whereby concentration of tensile stress is prevented at the brazed parts when said spring is bent in said predetermined direction (arrow).

4,618,278

PAPER FEED CONTROL IN A PRINTER

Hiroji Iwai, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 4, 1985, Ser. No. 697,878
Claims priority, application Japan, Feb. 15, 1984, 59-20706[U]
Int. Cl.[4] B41J *19/92*
U.S. Cl. 400—568 2 Claims



1. A paper feed control system in a printer comprising:
a paper feed drive pulse motor;
a platen which supports a record receiving paper sheet;
a transmission gear secured to a shaft of said platen, and mechanically connected to said paper feed drive pulse motor so as to transfer the rotation of said paper feed drive pulse motor to said platen;
a manual rotation knob secured to one end of said shaft of said platen so as to allow a manual rotation of said platen;
rotation position detection means associated with said paper feed drive pulse motor for developing a rotation pulse signal in response to the rotation of said paper feed drive pulse motor said detection means including two slit plates secured to a shaft of said paper feed drive pulses motor and corresponding photocouplers provided for detecting slits formed in said slit plates;
a counter which counts by the N^{th} number which receives said rotation detection pulse signal developed from said rotation position detection means, and develops a control output when said pulse signal is counted to the N^{th} number;
electrical detent means for conducting an electrical detent operation of said paper feed drive pulse motor in accordance with the contents stored in said counter; and
reset means for resetting said counter before initiating an automatic paper feed operation wherein when said manual rotation knob is held at a first position, a first type of manual paper feed operation is permitted wherein said platen is manually rotated while said electrical detent means is in an operative condition, and when said manual knob is held in a second position a second type of manual paper feed operation is permitted wherein said electrical detent means is not in an operative condition so as to ensure a fine adjustment of the record receiving paper sheet on said platen.

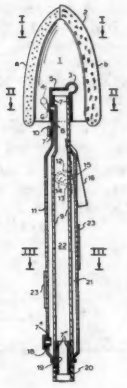
4,618,279

DISHWASHING APPARATUS WITH PLURAL SPONGES

Joseph Gurevich; Alex Gurevich, and Jan Gurevich, all of 64-40, 99 St., Rego Park, N.Y. 11374

Filed Feb. 15, 1984, Ser. No. 580,230
Int. Cl.[4] A47L *17/00, 13/19*; A46B *11/06*
U.S. Cl. 401—36 4 Claims

1. A dishwashing apparatus, comprising
a hand grip provided with water supply means and liquid detergent supply means and having an upper end, said liquid detergent supply means having a storage facility formed in said grip;
a tongue-like hollow working head mountable on said upper end of said grip so that said upper end of said grip extends into the interior of said hollow working head, said working head having an axis, said working head including a plurality of portions integrally arranged circumferentially around said axis and formed as contiguous sponges having different degrees of softness so as to apply to dishes different actions, said working head having a water outlet provided in one of said portions and communicating with said water supply means so that said water supply means supply water to be discharged through said water outlet, and said working head also having a liquid detergent outlet provided in another of said portions and communicating with said liquid detergent supply means so that said liquid detergent supply means supply detergent to be discharged through said liquid detergent outlet, whereby during rotation of said working head about said axis the discharged liquid detergent and said another portion act on a dish and then the discharged water and said one portion act on the same dish successively;



passage means including a passage communicating said liquid detergent supply means with said liquid detergent outlet and also a passage communicating said water supply means with said water outlet;
manually actuatable valve means cooperating with said passages so as to allow the liquid detergent and the water to flow selectively through the respective passages successively and to said liquid detergent outlet and water outlet successively so as to first wash and then rinse the dish; and
an adapter arranged to connect said grip with a faucet of water system.

4,618,280

PUSH-BUTTON WRITING INSTRUMENT WITH FRONT SEAL MEANS

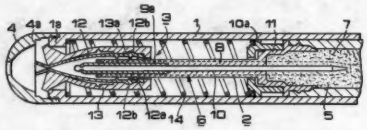
Hidehei Kageyama, Kawagoe, Japan, assignor to Toyo Polymer Co., Ltd., Tokyo and Kotobuki & Co., Ltd., Kyoto, both of, Japan

Filed Aug. 14, 1984, Ser. No. 640,693
Claims priority, application Japan, Feb. 1, 1984, 59-11628; Mar. 16, 1984, 59-37664
Int. Cl.[4] B43K *9/00*
U.S. Cl. 401—107 4 Claims

1. A push-button type writing instrument having a barrel and comprising:
(a) a refill received within said barrel and slidable in an axial direction thereof,
(b) a writing part receiving mechanism provided at a forward end portion of the refill, said writing part receiving mechanism being slidably coupled with a cylindrical base by way of a slide stem and an interlocking portion provided at a forward end of the slide stem and said writing part receiving mechanism being further equipped with a lead chuck adapted to open and enclose a cylindrical seal,

a chuck closing ring loose-fit on said lead chuck and a coil spring disposed under compression between said chuck closing ring and said cylindrical base,

(c) sealing means provided with the writing part receiving mechanism at said forward end portion of the refill for



sealing said writing part, and said sealing means being formed of an elastic cylindrical seal and a lead chuck fit over the cylindrical seal, and

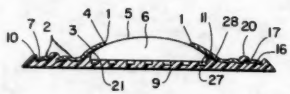
(d) said barrel being equipped adjacent to its forward end with an annular inwardly extending protrusion adapted to close the lead chuck.

4,618,281

RAISED PAVEMENT MARKER BRACE

Van R. Ajemian, 331 N. Vail Ave., Montebello, Calif. 90640

Filed Dec. 31, 1984, Ser. No. 688,066
Int. Cl.[4] E01F *9/01*
U.S. Cl. 404—16 **8 Claims**



1. A raised pavement marker brace configured and adapted to extend about a wholly stationary raised pavement marker having an uppermost surface and at least one side surface, said brace inseparably comprising

a retaining lip portion of uniform thickness extending snugly over at least a part of that portion of said uppermost surface of the marker adjacent to said side surface, and

a wall portion extending downward from said lip portion, said wall portion extending over at least a part of said side surface, said wall portion defining an opening about at least one existing reflective portion of said side surface, and

a base portion extending outward from said wall portion, said base portion extending contiguously about at least a part of said wall portion, said base portion comprising, in order to make better use of the adhesive used for securement, at least one of an uneven underside and an uneven periphery and a uniform width of said base portion beyond said wall portion.

4,618,282

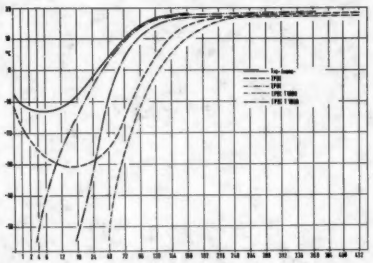
COMPOSITION AND A METHOD FOR COVERING THE SUMP IN CAVITIES

Karl F. L. Gloria, Hattingen; Alexandru B. Costinescu-Tataranu, Essen; Wilhelm Schuster, and Jürgen Wittekind, both of Frankfurt, all of Fed. Rep. of Germany, assignors to Ruhrgas Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Aug. 24, 1983, Ser. No. 526,081
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1982, 3231349
Int. Cl.[4] B65G *5/00*
U.S. Cl. 405—53 **14 Claims**

1. A method for covering the sump in cavities, especially cavities leached out of salt-domes, serving to store gaseous or liquid, non-aqueous substances, said method comprising the following steps:

(a) preparing a liquid mixture consisting of: a crude oil having functional groups and containing an amount not exceeding 7% by weight of hydrocarbons having at the most 5 C-atoms in the molecule, the specific weight thereof amounting, at a temperature of +20° C., to at the most 1.2 g/cm^3; and at least one reactive component which com-



bines with the functional groups of the crude oil and blocks said groups;

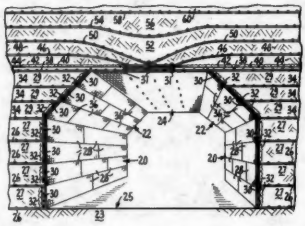
(b) applying said liquid mixture to, and distributing it over, the surface of the sump in an amount such as to form a layer at least 1 cm thick of the said mixture.

4,618,283

ARCHWAY CONSTRUCTION UTILIZING ALTERNATING REINFORCING MATS AND FILL LAYERS

William K. Hilfiker, Eureka, Calif., assignor to Hilfiker Pipe Co., Eureka, Calif.

Filed Sep. 6, 1984, Ser. No. 647,841
Int. Cl.[4] E21D *9/00*
U.S. Cl. 405—124 **35 Claims**



1. An archway construction over a pathway comprising:

a pair of vertical support sections disposed on opposite sides of the pathway;

a ceiling section which extends over the pathway and which is supported by said vertical support sections; and

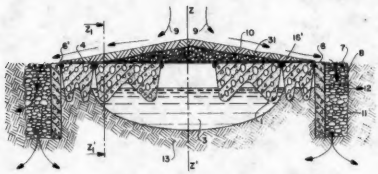
wherein said vertical support sections each include a plurality of reinforcing mats separated by one or more layers of unbound fill and said ceiling section includes a plurality of reinforcing mats, including a first mat and a second mat disposed above and connected to said first reinforcing mat.

4,618,284

DEVICE AND METHOD FOR THE RECLAMATION OF POLLUTED LAND AREAS

Alvin M. Marks, Bigelow Rd., Athol, Mass. 01331

Filed May 24, 1984, Ser. No. 613,799
Int. Cl.[4] B65G *5/00*; G21F *9/24*
U.S. Cl. 405—129 **2 Claims**



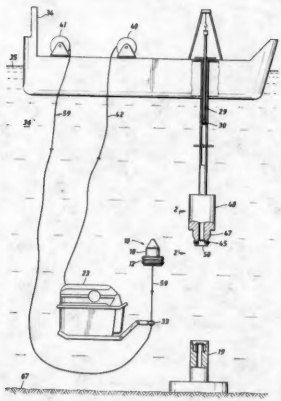
1. In a system for the reclamation of polluted areas, an interior polluted area, an exterior nonpolluted area surrounding said polluted area, a plurality of load-bearing modules, each of said modules having voids with average low density capable of floating on water, said modules having a substantially stable top flat surface, said modules being placed side by side abutting each other over the said polluted area, a rim around each of the said modules, gaskets mounted on each of the said rims, means on the said modules to draw the said modules together horizontally to compress said gaskets and form seals between said modules, a retaining wall around said polluted area, an annular moat around the said wall, said moat being filled with gravel and clean water, the said water in said moat sealing the polluted area from the exterior nonpolluted area, a film impervious to water and gas over the said top surface of the the said modules, and a sloping pebble and earth fill over the said film, whereby the pollutants are contained within the said polluted area.

4,618,285

BUOYANT RING GASKET INSTALLATION TOOL

Arthur G. Ahlstone, Ventura, Calif., assignor to Shell Offshore Inc., Houston, Tex.

Filed Feb. 19, 1985, Ser. No. 703,013
Int. Cl.[4] B63C *11/00*
U.S. Cl. 405—191 **17 Claims**



1. Method of attaching underwater a ring gasket to a ring gasket retainer assembly located in a submerged wellhead connector having an opening defined upwardly therethrough, said method employing the use of an underwater vehicle, said ring gasket mounted on a buoyant ring gasket installation tool, said tool operatively engaged in a buoyant manner to said underwater vehicle, said method comprising;

lowering said underwater vehicle, ring gasket, and buoyant ring gasket installation tool downwardly through the water together to a location adjacent said submerged wellhead connector,

transporting said buoyant installation tool carrying said ring gasket from said location adjacent said wellhead connector to a position substantially centrally beneath said wellhead connector opening,

floating said ring gasket and said buoyant tool upwardly into said wellhead connector opening into engagement therewith, and

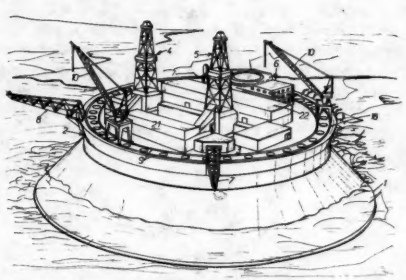
connecting said ring gasket to said wellhead connector.

4,618,286

COMPOSITE PLATFORM FOR PETROLEUM WORKINGS IN POLAR SEAS

Dominique Michel, Paris, France; Delbert B. Johnson, Houston, Tex.; Jean F. Pagès, Paris, France; Vincent F. P. Foglia, Aulnay-sous-Bois, France; Jean G. M. Martin, Paris, France; Michel P. Vaché , Combs-la-Ville, France; Francois G. Sedillot, Velizy, France, and Carroll M. Crull, Houston, Tex., assignors to Fluor-Doris Incorporated, Houston, Tex.

Filed Feb. 12, 1985, Ser. No. 700,950
Claims priority, application France, Feb. 16, 1984, 84 02345
Int. Cl.[4] B63B *35/44*; E02B *17/00*; E02D *5/54*
U.S. Cl. 405—208 **6 Claims**



1. A composite movable platform for use in petroleum explorations and drillings in polar seas, comprising a frustoconical first base section designed to be supported on the seabed, a cylindrical central second section, and a deck supported by said first and second sections for supporting drilling and production equipment, said first base section being formed as a watertight concrete structure and having the shape of a right-angled triangle and adapted to rest on the seabed on one side of the right angle, the hypotenuse of said triangle being a peripheral frustoconical wall and the third side of the triangle forming an inner cylindrical wall, the volume formed inside said walls forming ballastable tanks, and the apex opposite said one side being truncated and forming above sea level a peripheral ring in which are provided watertight passage tubes receiving anchoring piles parallel to said inner cylindrical wall, and wherein the cylindrical center second section is composed of at least one circular bottom, the said second section being housed inside the inner cylindrical wall of the concrete annular truncated cone and fixed watertightly to said wall, the bottom of the annular truncated cone and the circular bottom being in the same plane.

4,618,287.

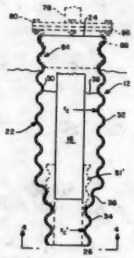
TECHNIQUES FOR ESTABLISHING INGROUND SUPPORT FOOTINGS AND FOR STRENGTHENING AND STABILIZING THE SOIL AT INGROUND LOCATIONS

Frank Kinnan, Camas Valley, Oreg., assignor to Electric Power Research Institute, Palo Alto, Calif.

Division of Ser. No. 458,817, Jan. 18, 1983. This application Aug. 2, 1984, Ser. No. 637,127

Int. Cl.[4] E02D *5/64*

U.S. Cl. 405—232 **8 Claims**



1. A casing especially suitable for use as a footing around an inground segment of a post, pole or other such object, said casing comprising a main body having opened top and bottom ends larger in diameter than the maximum width of said inground segment, an uppermost cylindrical end section including said top end, a lowermost cylindrical end section including said bottom end, said lowermost end section being smaller in diameter than said uppermost end section, and a radially tapering intermediate section joining said end sections, said main body also having a helically threaded outer surface between its ends sufficient to allow the casing to be threaded into the ground around said inground sections starting at its bottom end, the bottom and intermediate sections of said casing serving to limit the amount of soil entering the casing from its bottom end as the casing is threaded into the ground where by soil initially entering the bottom end of said casing as the latter is threaded into the ground eventually moves through the tapering intermediate section and into the uppermost end section where it has room to break up.

4,618,288

RELEASABLE LOWERING AND COUPLING ASSEMBLY FOR PILE DRIVING

Verlon C. Daigle, Gray, La., assignor to McDermott International, Inc., New Orleans, La.

Filed Oct. 4, 1985, Ser. No. 784,392

Int. Cl.[4] E02D *7/00*

U.S. Cl. 405—232 **8 Claims**

1. A pile lowering and coupling assembly comprising:

a skirt pile having an upper region and a catch secured to said skirt pile in said upper region;

a follower pile sized to engage said upper region of said skirt pile;

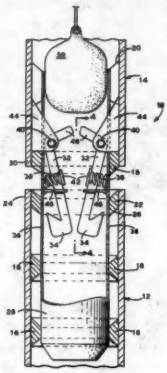
a stabbing guide secured to said follower pile for concentrically aligning said skirt and said follower piles;

at least one latching arm pivotally secured to said follower pile having a latching end region configured to latch with said catch of said skirt pile;

first bias means for pivoting said latching end region in a first direction away from said catch;

second bias means for pivoting said latching end region in a second direction toward said catch; and,

operating means for selectively pivoting said latching end region whereby when said first bias means overcomes the bias of said second bias means, said latching end region is moved in said first direction and, when said second bias



means overcomes the bias of said first bias means, said latching end region is moved in said second direction.

4,618,289

METHOD OF FORMING A CAST-IN-PLACE SUPPORT COLUMN

David L. Federer, 5058 Sirron Ct., Dunwoody, Ga. 30338

Filed May 22, 1984, Ser. No. 599,727

Int. Cl.[4] E02D *5/34*

U.S. Cl. 405—236 **8 Claims**

1. A method of forming a cast-in-place support column of solid diameter comprising the steps of:

a. Positioning a driving foot, having a portion of cross-sectional shape and size corresponding to the desired cross-sectional shape and size of the support column, into contact with the ground surface at the desired column location;

b. Positioning an elongated hollow rigid driving mandrel, having a cross-sectional size slightly smaller than the driving foot, with the mandrel having an upper and a lower section;

c. Driving the driving foot and the mandrel into the ground to a desired depth;

d. Continuing to drive the driving foot and mandrel while introducing liquified fill material under pressure into the hollow portion of the driving mandrel so as to substantially fill the lower section of the hollow mandrel with fill material as desired, the pressure on the liquified fill material being maintained so that a portion of the liquified fill material is conveyed through a plurality of radial apertures in the lower section of the mandrel to exert a pres-

sure against walls of the hole surrounding the mandrel so as to prevent the walls from collapsing upon the mandrel and adjusting the pressure so as to avoid the excessive loss of liquified fill material out of the area in which the support column is to be formed;

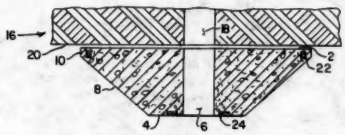
e. Allowing said liquified fill material to harden to form the support column when the desired depth is obtained.

4,618,290

PRECAST ROOF BEARING BLOCK

Roger M. Hansen, 1544 Panorama Dr., Birmingham, Ala. 35216

Filed Jun. 27, 1983, Ser. No. 507,748
Int. Cl.[4] E21D *21/00*
U.S. Cl. 405—259 **25 Claims**



1. A precast mine roof supporting bearing block assembly comprising

a mine roof,

a molded mine roof bearing block body,

said body having an upper roof surface engaging bearing surface and a lower bearing surface,

said bearing surfaces being substantially parallel,

said upper bearing surface being larger than said lower bearing surface,

a lateral surface connecting said bearing surfaces,

a hole extending through said body from one said bearing surface to the other said bearing surface,

reinforcing means disposed within said molded body,

said reinforcing means including first reinforcing means disposed closer to said upper bearing surface than to said lower bearing surface,

roof bolt means having a head disposed adjacent to said lower bearing surface and a shank, and

said roof bolt means shank being introduced into said hole adjacent to said lower bearing surface extending through said body into a hole in the mine roof and being in tension such that the roof bolt head disposed at said lower bearing surface applies a compressive force to said block.

4,618,291

NUT MEMBER AND MINE ROOF SUPPORT SYSTEM INCORPORATING SAME

Raymond L. Wright, Syracuse, N.Y., assignor to The Eastern Company, Naugatuck, Conn.

Filed Feb. 22, 1985, Ser. No. 704,254
Int. Cl.[4] E21D *20/02*; F16B *37/00*
U.S. Cl. 405—261 **2 Claims**

1. An improved mine roof support system including a support plate having a central opening, and an elongated rod having a leading end inserted into a drill hole behind a resin cartridge and advanced to break the cartridge and rotated to mix the components thereof to form a hardened, chemical anchor for said rod, and a trailing end of predetermined diameter from which said rod is threaded for a portion of its length. wherein the improvement comprises a nut element engaged with a said threaded portion of said rod, said nut element comprising:

(a) a generally cylindrical stem portion of diameter less than that of said central opening in said support plate and extending therethrough into said drill hole;

(b) a base portion of cross sectional dimensions larger than said support plate opening and integrally adjoining said stem portion on the side of said plate opposite said rod;

(c) an unobstructed, through opening extending axially from end to end of said nut element, through both said stem: and base portions, the wall of said through opening extending into said base portion providing wrench engagement surfaces;

(d) a frangible, annular, shear ring extending integrally inward from the wall of said through opening to define a circular lip having a diameter less that said predetermined diameter;

(e) an internally threaded portion extending from the end of said through opening in said stem portion opposite the juncture thereof with said base portion for a first axial length of said nut element;

(f) a first, smooth-walled portion of said through opening of diameter larger than said predetermined diameter extending for a second axial length of said nut element from the terminus of said threaded portion to said shear ring; and

(g) a second, smooth-walled portion of said through opening of diameter larger than said predetermined diameter extending for a thrid axial length of said nut element from said shear ring to said wrench engagement surfaces, whereby said rod may be threaded into said nut element to bear against said shear ring and rotation of said nut by a wrench engaged with said wrench engagement surfaces will be imparted to said rod, thereby mixing said resin components and excess torque applied to said nut element after said components harden to prevent rotation of said rod will fracture said shear ring and permit further rotation of said nut element to tension said rod.

4,618,292

CONTROLS FOR SEMICONDUCTOR WAFER ORIENTOR

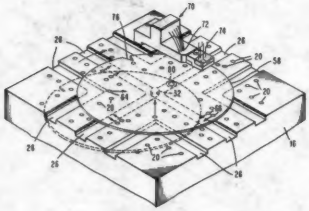
Robert L. Judge, Poughkeepsie, N.Y., and Anthony D. Wutka, Burlington, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 772,393, Feb. 28, 1977, abandoned.
This application Aug. 8, 1980, Ser. No. 176,374
Int. Cl.[4] B65G *51/03, 47/24*
U.S. Cl. 406—19 **10 Claims**

1. In a semiconductor wafer orientor with a wafer supporting fluid film that imparts rotational motion to the wafer around some point in the orientor, and having object sense means including two closely spaced electro-optic device means photoelectrically generating separate electrical signals that are compared to sense the presence of an indicia on the edge of the wafer over a first location on the orientor and also having a pneumatic stop means which when it is on stops motion of the wafer relative to that point and when it is off allows the wafer to rotate on the wafer supporting fluid film, a new control mechanism which enables the placing of the wafer in the orientor and the orienting of the wafer without contacting the edge of the wafer with a solid object comprising:

control means coupled to the pneumatic stop means for causing the pneumatic stop means to exert pneumatic pressure on the wafer to guidelessly stop the wafer over the point as the wafer is moving through the orientor on the fluid film and then when the wafer is so stopped for turning off said pneumatic stop means to end the pneumatic pressure on the wafer allowing the wafer to freely rotate with unhindered motion around the point under the influence of the supporting fluid film;

a second object sense means having a string of electro-optic device means which does not include either of the two closely spaced electro-optic device means and which is positioned at a second location of the orientor that is angularly advanced from the first location an amount that



is considerably larger than the angular spacing of the two closely spaced electro-optic sense means for producing an output when the indicia on the wafer is sensed by an electro-optical sense means in said string of electro-optic sense means as passing over the second location while it rotates with said unhindered motion around the point;

electronic oscillating means coupled to said control means and responsive to said output of the optical sense means for ending said unhindered motion by operating said pneumatic stop means on for a period and off for a period so that the wafer rotates with a jogging motion from said second location to said first location where all motion of the wafer relative to the orientor is stopped when the two electro-optic device means are illuminated substantially equally by light passing through the indicia.

4,618,293

METHOD AND APPARATUS FOR PNEUMATICALLY TRANSPORTING ROD-SHAPED ARTICLES OF THE TOBACCO PROCESSING INDUSTRY

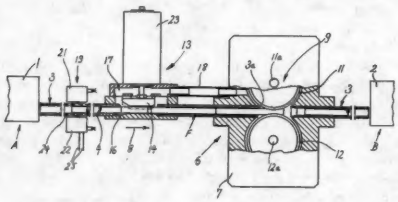
Bob Heitmann, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Feb. 5, 1985, Ser. No. 699,187

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1984, 3404885

Int. Cl.⁴ B65G *51/02*

U.S. Cl. 406—28 **12 Claims**



1. A method of transporting rod-shaped articles of the tobacco processing industry axially between an article discharging station and an article receiving station along an elongated path which is defined by a pneumatic conveyor, comprising the steps of propelling a series of successive articles from the discharging station into the elongated path; mechanically influencing the speed of successive articles of said series in a first portion of said path ahead of the receiving station so that each of the thus influenced articles advances at a predetermined speed and the articles form a file of closely adjacent articles extending from said first portion upstream toward said discharging station; pneumatically accelerating successive foremost articles of the file in a second portion of said path between said first portion and said receiving station so as to establish gaps between successive accelerated articles and the next-following articles of the file; monitoring the length of the file; and mechanically arresting the articles of such file when the monitored length is less than a predetermined length.

4,618,294

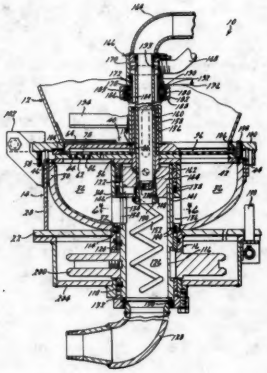
CONCRETE FEEDER APPARATUS

Warren D. Brown, Birmingham, Mich., assignor to Sprayton Equipment Company, Birmingham, Mich.

Filed Feb. 1, 1985, Ser. No. 697,493

Int. Cl.⁴ B65G *53/46*

U.S. Cl. 406—113 **14 Claims**



2. A receiver and transmitter of granular material such as concrete comprising:

a hopper adapted to contain a supply of said material;

an annular array of charging chambers positioned in non-rotating underlying relationship to said hopper;

rotary valve means interposed between said hopper and said array of charging chambers, said valve means being operative to selectively place successive ones of said charging chambers in communication with said hopper whereby they are filled with said material;

each of said charging chambers having a generally radially inwardly directed opening positioned adjacent the lower end thereof so as to facilitate full discharge of said material;

a rotatable tubular member positioned coaxially within said array of charging chambers and defining a mixing chamber open at the lower end thereof, said tubular member including an opening in the sidewall thereof successively alignable with said radially inwardly directed openings in said charging chambers whereby material may move from respective ones of said charging chambers into said mixing chamber as said tubular member is rotated;

means within said tubular member defining a fluid passage opening into said mixing chamber at the upper end thereof whereby one or more additives may be added to said material which has been received within said mixing chamber;

agitator means within said mixing chamber, said agitator

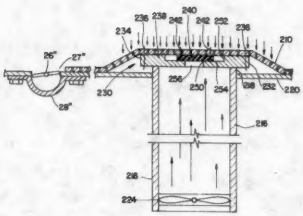
means being operative to intermix said material and said additives.

4,618,295

PLENUM CHAMBER FLOW RESTRICTOR AND CHECK VALVE

Richard H. Dugge, St. Louis County, and Jan D. Holt, St. Charles County, both of Mo., assignors to ACF Industries, Incorporated, Earth City, Mo.

Filed Aug. 24, 1984, Ser. No. 644,083
Int. Cl.[4] B65G *53/18*
U.S. Cl. 406—138 **2 Claims**



1. A flow restrictor, comprising:

a fixed wall; an air inlet nozzle extending through said wall and defining a membrane valve seat; a resilient and flexible porous membrane located over said wall and over said valve seat in a first position; a flexible impervious member attached to a surface of the membrane such that when the membrane is in said first position, the impervious member is located over the valve seat such that air from said air inlet is substantially only in operative communication with the air impervious member; whereby when air is supplied through the inlet nozzle between the wall and the membrane, pressure on the side of the membrane between the wall and the membrane causes the membrane to lift off the valve seat to a second position, thereby increasing its area in operative communication with air pressure between the membrane and the wall; and whereby in said second position air passes through the membrane at least in that portion of the membrane not occupied by the impervious member; and whereby when air flow through said air inlet nozzle is interrupted gravity and/or air pressure forces the impervious member downward against said valve seat reducing its operative area substantially to that extending across the air inlet nozzle and substantially shutting off the flow of air into said air inlet nozzle, wherein said impervious member contains an opening and a second impervious member is located within said opening and is located generally above said seat and is also attached to said membrane.

4,618,296

CUTTING TOOL AND INSERT THEREFOR

Paul B. Allaire, Troy, and Daniel R. Stashko, Holly, both of Mich., assignors to GTE Valeron Corporation, Troy, Mich.

Continuation of Ser. No. 531,844, Sep. 14, 1983, abandoned. This application Jun. 28, 1985, Ser. No. 781,205
Int. Cl.[4] B23C *5/02*
U.S. Cl. 407—42 **13 Claims**

1. A cutting tool comprising:

a cylindrical shank terminating in a spherical cutting end, the cutting end including first and second indexable cutting inserts each comprising first and second equilateral polygonal major faces, three identical planar flank surfaces forming the sides of the polygon with two of the flank surfaces intersecting at each corner thereof, the first major face including upwardly sloping convex portions intersecting each flank surface to form identical arcuate cutting edges along each side of the polygon, said convex portions including corresponding clearance face portions extending along said first major face rearwardly from said cutting edges, said second major face intersecting each flank at an obtuse angle forming identical rake edges; first and second mounting cavities shaped for respective receipt, in lay-down fashion of the first and second indexable cutting inserts; and means mounting the first and second indexable cutting inserts respectively to the first and second mounting cavities, the first cavity oriented such that an active arcuate cutting edge of the first insert placed in lay-down

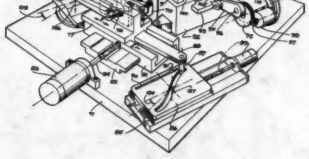
fashion in the first cavity will extend radially outwardly from a corner arc of the insert passing through a longitudinal axis of the shank, and the second cavity positioned on the cutting end with respect to the first cavity such that the second insert placed in lay-down fashion therein presents an active arcuate cutting edge whose cutting zone partially overlaps that of the first insert's cutting edge and extends the arcuate cutting action of the first insert substantially in a common plane passing through the shank axis, thereby enabling the cutting tool to generate an arcuate out of substantially uniform radius.

4,618,297

METHOD AND APPARATUS FOR MACHINING RACKS FOR STEERING GEAR

Arthur E. Bishop, 17 Burton St., Mosman, N.S.W., Australia, and Klaus J. Roeske, Beverley Hills, Australia, assignors to Arthur E. Bishop, Mosman, Australia

Filed Jul. 20, 1984, Ser. No. 632,662
Claims priority, application Australia, Jul. 21, 1983, PG0399
Int. Cl.[4] B23D *37/06*; B23F *1/08*
U.S. Cl. 409—58 **4 Claims**



1. A machine for cutting the teeth of a rack for a variable ratio rack and pinion steering gear employing a helical pinion having a plurality of identical teeth engaged with a rack having some tooth gaps of varying form and angular disposition to the rack axis, said machine comprising a base, a spindle adapted to carry a tool with a single cutting tooth having cutting edges which lie on the surface of a single tooth of said helical pinion, a housing on said base, means supporting said spindle for helical reciprocation in the housing between two predetermined limits about a mid position in which said tool is directed normally to the plane of the teeth of said rack, a fixture supporting said rack on the base and means for relatively moving said rack

and said tool with translatory curvilinear motion during the cutting of a gap of said rack, said motion for any one said tap being a part of the locus of said helical pinion when slid without rotation in the same said gap of said rack.

4,618,298

METHOD FOR CONSTRUCTING AN ENLARGED TUNNEL AND APPARATUS FOR FORMING THE SAME

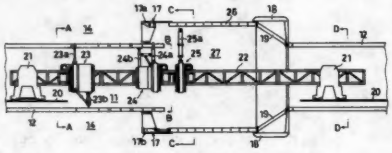
Shigeo Takamiya; Kazutoshi Inoue, and Kenzo Tsutaya, all of Tokyo, Japan, assignors to Mitsui Kensetsu Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1984, Ser. No. 595,406

Claims priority, application Japan, Mar. 30, 1983, 58-54635

Int. Cl.[4] E21D *11/00, 9/06*

U.S. Cl. 405—150 **13 Claims**



1. A method for constructing an enlarged tunnel wherein a portion of a predetermined region of an existing tunnel to be enlarged is circumferentially enlarged by the following steps:

excavating to form a circumferentially enlarged portion defining a starting base for a shield machine;

positioning a shield machine in the circumferentially enlarged portion;

cutting a tubular liner lining the existing tunnel into segment pieces;

advancing the shield machine forward along the existing tunnel in order to enlarge the circumference of the predetermined region of the existing tunnel;

removing those segment pieces of the liner of the existing tunnel; and

circumferentially lining the resultant enlarged tunnel portion with segments.

4,618,299

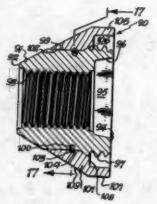
LOCKNUT AND KEY THEREFOR

Gary R. Bainbridge, North Tonawanda; Lewis D. McCauley, Eggertsville, and John H. Taylor, Orchard Park, all of N.Y., assignors to McGard, Inc., Buffalo, N.Y.

Filed Mar. 7, 1984, Ser. No. 587,135

Int. Cl.[4] F16B *23/00, 37/14*

U.S. Cl. 411—374 **4 Claims**



1. A locknut comprising a body portion having an outer surface and an axis of rotation and first and second opposite ends, a threaded bore extending inwardly into said body portion from said first end, a depression extending inwardly into said body portion from said second end, and endless lobed curvilinear surface located outwardly of said axis of rotation and defining the periphery of said depression, a thread on said outer surface extending inwardly from said second end toward said first end, said outer surface including an elongated cylindrical outer surface portion between said thread and said first end, a sleeve rotatably mounted on said elongated cylindrical outer surface, and an annular shroud portion on said sleeve located radially outwardly of said thread in spaced relation thereto, said outer surface including a frustoconical surface having its smaller end at said first end, and said sleeve including a second frustoconical outer surface which is in alignment with said frustoconical surface.

4,618,300

QUICK-CLAMPING NUT FOR USE WITH A THREADED MEMBER

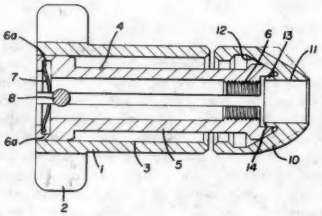
Eickhart Goebel, Elbestr. 11, 6102 Pfungstadt, Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,314

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1983, 8325783[U]

Int. Cl.[4] F16B *37/08*

U.S. Cl. 411—433 **3 Claims**



1. A quick-clamping nut for engaging an externally threaded member for engagement therewith with a minimum of turning to lock a first member to a second member, the second member carrying the threaded member, said nut comprising:

(a) a tubular housing having an inner bore and including external turning means, said housing including a pair of opposed apertures adjacent an end thereof defining a pivot axis;

(b) a pair of elongated, similarly configured segments carried within said housing and pivotable about said pivot axis, said elongated segments each including outer ends having an internal thread formed therein and having an outwardly facing tapered surface, and including inner ends contacting said inner bore of said housing and carrying biasing means to urge the outer ends apart;

(c) a pivot pin extending transversely across said inner bore of said housing and securely received in said opposed apertures to define a pivot surface about which said elongated segments pivot, said pin extending between and contacting said elongated segments to cause said segments to rotate with said housing; and

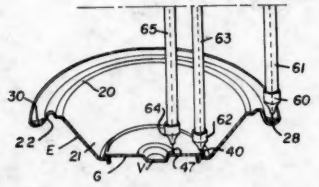
(d) a clamping cone having a through bore, an outer surface adapted for engagement with the first member, an inner tapered surface for cooperative engagement with the outwardly facing tapered surfaces of said elongated segments so that axial movement of said elongated segments into said clamping cone operates to cause the tapered surfaces to come into contact and to urge the outermost ends of said elongated segments inwardly toward each other to engage the internal threads therein with the externally threaded member, and limiting means carried by said clamping cone for limiting the inward movement of said elongated segments toward each other.

4,618,301

CONICAL CAN END WITH PUSH DOWN GATE

Gerald B. Klein, 13451 Stuart Ct., Broomfield, Colo. 80020

Division of Ser. No. 63,794, Aug. 6, 1979, Pat. No. 4,244,490.
This application Jul. 8, 1980, Ser. No. 166,968
Int. Cl.[4] B21D *51/26*
U.S. Cl. 413—8 3 Claims



1. A method for sealing and coating the underside of a can end of the type having a concentrically disposed aperture with a gate therein defined by a gate panel which is cut through about a peripheral score line, said method comprising the steps of:

inverting the can end;

applying a globule of fluid sealant at the center of the underside of can end; and

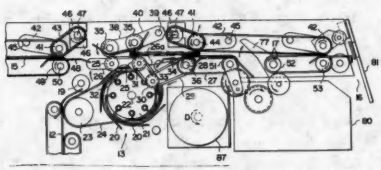
rotating the can end about its axis while in the inverted position to flow the globule of fluid sealant by centrifugal action outwardly from the center of the can end and into the cut through score line to seal the score line and to effect the deposit of a dielectric coating on the underside of the can end.

4,618,302

DEVICE FOR ACCUMULATING AND DELIVERING PAPER SHEETS

Eiichi Kokubo, and Akira Hirata, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 298,585, Sep. 2, 1981, abandoned. This application Mar. 5, 1984, Ser. No. 585,029
Claims priority, application Japan, Sep. 4, 1980, 55-122642
The portion of the term of this patent subsequent to Dec. 14, 1999, has been disclaimed.
Int. Cl.[4] B65H *29/40*
U.S. Cl. 414—33 3 Claims



1. An apparatus for accumulating and delivering paper sheets to a plurality of conveyor belts for use with a bank note dispenser, said apparatus comprising:

a paddle wheel rotatably mounted on a horizontal shaft, said paddle wheel being provided with a plurality of swirling paddles for receiving paper sheets therebetween;

a scraper disposed adjacent the periphery of said paddle wheel to scrape the paper sheets away from said swirling paddles;

an alignment plate adapted to be held vertically during the accumulating operation to engage with the paper sheets at the leading ends thereof for aligning the paper sheets above the paddle wheel;

lower and upper delivery roller means cooperating to deliver, at one time, the accumulated paper sheets as a whole above the paddle wheel in a horizontal direction;

said lower delivery roller means comprising a pair of lower rollers adapted to be raised upwardly to horizontally support the accumulated paper sheets thereon and to be rotatably driven for delivery of the paper sheets, and the axis of each said lower roller being spaced from each other; and

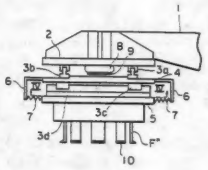
said upper delivery roller means comprising a pair of upper rollers adapted to be lowered downwardly to resiliently clamp the paper sheets between the pair of the lower rollers and the pair of the upper rollers and to be rotatably driven for delivery of the paper sheets.

4,618,303

TIRE SUPPLYING APPARATUS

Nobuhiko Irie, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Division of Ser. No. 511,092, Jul. 6, 1983. This application Sep. 24, 1985, Ser. No. 779,523
Claims priority, application Japan, Jul. 6, 1982, 57-117417
Int. Cl.[4] B65H *5/12*
U.S. Cl. 414—226 3 Claims



1. A green tire supplying apparatus for supplying a green tire to a selected position with respect to a vulcanizing press, the selected position having a center corresponding to a center of a green tire to be supplied to the selected position comprising:

a self-propelled green tire wagon for carrying a green tire; and

a green tire unloading means mounted on said wagon for transferring a green tire from said wagon to the selected position;

said green tire unloading means comprising an arm which is movable with respect to said wagon, a green tire holding device for holding a green tire, said holding device having a plurality of pawls movable to engage and disengage from a green tire, said pawls having a center of operation corresponding to a center of a green tire to be held by said holding device, said green tire unloading means also comprising automatic aligning means connected between said arm and said holding device for moving said center of operation in any radial direction with respect to said arm so as to bring said center of operation into correlation with the center of the selected position;

said automatic aligning means comprises a first disc element fixed to said arm, a second disc element mounted to said first disc element for movement in a first radial direction, a plate fixed to said holding device and mounted to said second disc element for movement in a second radial direction which is perpendicular to said first radial direction, and brake means engageable between said first disc element, said second disc element and said plate, for maintaining a relative radial position therebetween;

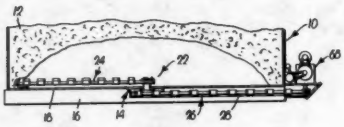
biasing means connected between said first disc element and said second disc element for biasing said first and second disc elements into a selected position in said first radial direction; and

biasing means connected between said second disc element and said plate for biasing said secod disc element and said plate into a selected position with respect to said second radial direction.

4,618,304
SILO HOPPER FOR SILAGE UNLOADERS

Edward M. Finger, Rte. 1, Powhattan, Kans. 66527

Filed Dec. 31, 1984, Ser. No. 687,967
Int. Cl.[4] B65G *65/42*
U.S. Cl. 414—306 8 Claims



1. In an upright, cylindrical silo for storing silage, having a U-shaped silage-receiving cavity in the bottom thereof, a floor at a higher elevation than the cavity and provided with a U-shaped opening vertically aligned with the cavity, a silage unloader including mechanism above the floor for dislodging the silage and funneling the same gravitationally into the opening, and a conveyor for lateral feeding of the dislodged silage to the exterior of the silo, said mechanism having rotatable silage-dislodging means situated above said opening, said silage-conveying means including rotatable paddle means located within said cavity below said opening, and means including upright shaft means presenting a rotational axis for selective, alternate movement in both the clockwise and counterclockwise directions of said silage-dislodging means and said paddle means, the improvement of which comprises:

a hopper in the cavity for receiving the dislodged silage from said mechanism, said hopper including:

a U-shaped, upright wall having a bight, a pair of elongated, horizontally-spaced legs and a discharge port in opposed relation to the bight for flow of dislodged silage therethrough in response to operation of said conveyor,

said wall having an upper edge extending along the legs and the bight thereof and being disposed at a lower elevation than the floor, and

a U-shaped, slip ramp interposed between the wall and the floor in direct communication with the opening and the confines of said wall,

said ramp having a smooth, flat, inner surface and sloping downwardly and inwardly from said floor to said edge at an angle along which the silage will freely slide downwardly and inwardly from the opening into said confines of the wall without any appreciable repose on said surface; and

a rotatable rake assembly, including:

an elongated rake having an inner end and an outer end and located in the region between said silage-dislodging means and said paddle means;

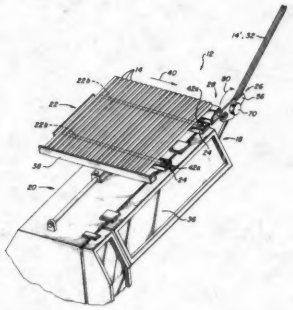
means operatively and pivotally coupling the inner end of said rake to said shaft means for rotation of the rake assembly in both of said directions with said silage-dislodging means and said paddle means, and for pivoting movement of the rake about an upright axis independently of said rotation of the rake assembly with the silage-dislodging means and the paddle means; and

stop structure associated with said rake for engaging and holding the same in an operating position extending outwardly from said shaft means when said moving means is operated to rotate the rake assembly in one of said directions, and for permitting the rake to pivot to a retracted position adjacent said shaft means when said moving means is operated to rotate the rake assembly in the other of said directions.

4,618,305
AUTOMATIC FEED APPARATUS AND PROCESS FOR INTEGRATED CIRCUITS STORED IN TUBES

Nicholas J. Cedrone, Wellesley Hills, and Kenneth R. Lee, Lincoln, both of Mass., assignors to Daymarc Corporation, Waltham, Mass.

Filed Nov. 23, 1983, Ser. No. 554,776
Int. Cl.[4] B65B *35/30*
U.S. Cl. 414—403 30 Claims



1. A process for automaticlaly feeding elongated tubes having a first open end and a second closed end and each loaded with plurality of integrated circuits (IC's) held in a line within the tube to the input of a test handler/sorter, comprising the steps of

A. providing an accumulating conveyor table that transports the tubes laterally in a first direction;

B. inclining said conveyor table from the horizontal about a lower edge that extends generally in said first direction;

C. placing said tubes on said conveyor table with said tubes lying on their side and oriented generally transverse to said first direction and with said second closed end adjacent said lower edge;

D. transporting said tubes placed on said conveyor table transversely across said table in said first direction to a pick-up position adjacent one end of said conveyor table and oriented substantially perpendicular to said first direction;

E. sensing when one of said tubes is located at said pick-up position;

F. gripping said tube in said pick-up position in response to said sensing at its open upper end;

G. rotating said gripped tube about an axis that is generally parallel to said first direction to transport said open end to a discharge position at said input.

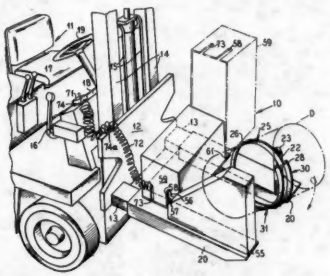
4,618,306
SELF CONTAINED DRUM DUMPER FOR FORK TRUCKS

William J. Dorsch, Wheeling, Ill., assignor to Liftomatic Material Handling Co., Inc., Evanston, Ill.

Continuation of Ser. No. 480,900, Mar. 31, 1983, abandoned.
This application Jul. 26, 1985, Ser. No. 758,847
Int. Cl.[4] B65G *65/24, 65/34*
U.S. Cl. 414—420 14 Claims

1. An independent self powered drum dumping attachment unit quickly mounted on, operated in its mounted position, and demounted from the forks of driver seat equipped fork lift trucks by the truck driver without leaving the truck seat and controlled by the driver from his seat when mounted on the forks which comprises a U-shaped frame having a rear bight portion and forwardly projecting sides with elongated hollow fork receiving shoes with open rear ends for receiving the forks, a drum encircling clamp between the front ends of the sides of the U-shaped frame and rotatably mounted on said

sides, a hydraulic jack mounted on one side of the U-shaped frame for rotating said drum encircling clamp, an energy source on the bight portion of said frame for said jack, a single portable switch controlling the energy source and the hydraulic jack adapted to be selectively positioned on the fork lift truck adjacent the driver seat when the attachment is mounted on the forks of the truck, and a single flexible cord connection between the energy source and switch.



4,618,307

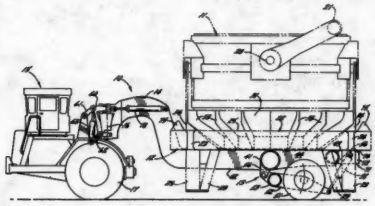
SCRAP BUCKET CARRIER

Edward S. Kress; William L. LaBerdia, and Dennis R. Thomas, all of Brimfield, Ill., assignors to Kress Corporation, Brimfield, Ill.

Filed Feb. 22, 1985, Ser. No. 704,382

Int. Cl.[4] B60P *1/64*

U.S. Cl. 414—498 **2 Claims**



1. A carrier for lifting and transporting a scrap bucket supported in a stand having a substantially rectangular lower frame with front, rear and side beams and depending ground engaging legs located substantially at the four corners thereof, comprising in combination, a self-propelled tractor and a wheeled trailer having a main frame cross member dimensioned to fit between the stand legs and an integral forwardly projecting tongue with a gooseneck pivotally connected to the tractor to permit turning thereof at substantially right angles, a rear frame member secured to the main frame member by a plurality of vertical plates, means for journalling the trailer wheels on a plurality of trailing arms each pivotally connected at one end to the main frame member and interconnected at the other end to the rear frame member by a first hydraulic actuator for raising and lowering the trailer, stand and bucket to transport position, and means including links and a second hydraulic actuator interconnecting the gooseneck to the tractor for raising and lowering the trailer tongue to maintain the trailer substantially level as the first and second hydraulic actuators are simultaneously extended and retracted, a plurality of lift plates projecting substantially tangentially rearwardly and horizontally from the rear frame member so as to underlie and support the rear beam of the stand, said lift plates being secured to the rear frame member by rigid box sections and being disposed in substantially the same horizontal plane as the top surfaces of said main frame cross member and integrally connected tongue, the outboard ones of said lift plates being formed with outside edges extending rearwardly and inwardly with respect to the trailer centerline to help guide the trailer between the stand legs, the trailing ends of said lift plates and supporting box sections being angled downwardly to help guide the trailer under the rectangular frame of the stand, and the stand being provided with guide means projecting forwardly from its front beam to cooperate with the trailer gooseneck to center the stand laterally on the trailer.

4,618,308

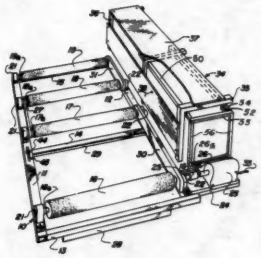
CARPET HANDLING DEVICE

Lee J. Ballard, 1912 Armstrong Dr., Plano, Tex. 75074

Filed Feb. 13, 1984, Ser. No. 579,415

Int. Cl.[4] B60P *1/00*

U.S. Cl. 414—532 **12 Claims**



1. A carpet roll handling device for use with a transport vehicle comprising: a frame adapted to rest wholly within the bed area of the transport vehicle with a tailgate of the vehicle in a closed position and to be moved to a position extending over the tailgate of the vehicle in a lowered open position for moving a roll of carpet relative to the vehicle; a cross member intermediate opposite ends of said frame, said cross-member having a downwardly projecting lip member adapted to be received in a space between the bed of the transport vehicle and the lowered tailgate of the vehicle; a plurality of rollers mounted transversely at spaced intervals along the length of said frame and coupled to be driven simultaneously in rotational motion in the same direction, said rollers having surfaces textured to provide a high coefficient of friction upon engagement with a roll of carpet; and reversible drive means coupled to provide rotational drive to said rollers.

4,618,309

MECHANICAL HANDLING MECHANISM, IN PARTICULAR FOR THE LOADING AND UNLOADING OF MACHINE TOOLS

Hans Gregg, Woerthsee, and Theodor Artmeier, Puchheim, both of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Jan. 11, 1985, Ser. No. 690,797

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1984, 3404553

Int. Cl.[4] B65G *11/00*

U.S. Cl. 414—753 **10 Claims**

1. A mechanical handling mechanism comprising at least one gripping mechanism or the like, which is movable back and forth between an initial and an end position, comprising:

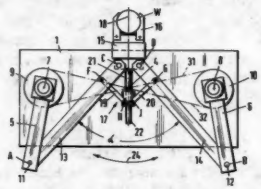
(a) two swivel arms rotationally drivably supported about axes which are parallel to one another on a base plate;

(b) a hinged arm is hinged to each free end of the swivel arms;

(c) the free ends of the hinged arms are hinged to a common

joint head, which carries at least a gripping mechanism thereon;

(d) a steering knuckle arm hinged to each of the hinged arms such that the steering knuckle arms form a sliding joint



parallelogram with the hinged arms, the slide member of which parallelogram is guided on the joint head; and

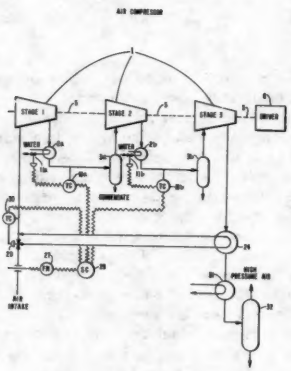
(e) the axes of all joints lie parallel with respect to the axes of rotation of the swivel arms.

4,618,310

METHOD OF MULTI-STAGE COMPRESSOR SURGE CONTROL

Herbert D. Michelson, Fort Lee, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 7, 1984, Ser. No. 618,080
Int. Cl.[4] F04D *27/02*
U.S. Cl. 415—1 **14 Claims**



1. An improvement in an anti-surge control method for a multi-stage centrifugal compressor having interstage cooling means which comprises, when the stages are at different approaches to surge, controlling the temperature of the gas flowing to the inlet of any critical stages thereby allowing the gas to heat up to increase the volume thereof so that said critical stages are put at a more distant approach to surge.

4,618,311

VANE ANGLE CHANGING DEVICE FOR AN AXIAL FLUID MACHINE

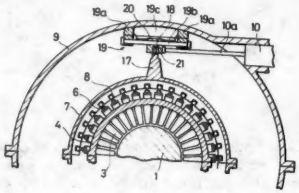
Haruo Miura; Takashi Nagaoka; Yoshiaki Abe, and Souji Sakata, all if Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 7, 1983, Ser. No. 511,734
Claims priority, application Japan, Jul. 7, 1982, 57-116766
Int. Cl.[4] F04D *29/36*
U.S. Cl. 415—149 R **34 Claims**

1. A vane angle changing device for an axial-flow fluid machine having a rotor means, an inner casing means, an outer casing means disposed exteriorly of said inner casing means, a rotatably mounted intermediate cylinder means disposed between said inner and outer casing means, stationary vane means, means for rotatably mounting said stationary vane means for enabling a selective adjustment of a mounting angle of the stationary vane means, an actuator means for rotating said intermediate cylinder means, the vane angle changing device comprising:

at least one arm means having a first end connected to said intermediate cylinder means;

a first means adapted to be selectively reciprocated in a direction substantially perpendicular to a longitudinal center axis of the rotor means for transmitting an adjusting force to said intermediate cylinder means;



second means formed in one of said first means and a second end of said at least one arm means for transmitting the force from said first means to said at least one arm means in a direction substantially perpendicular to the longitudinal center axis of the rotor means; and

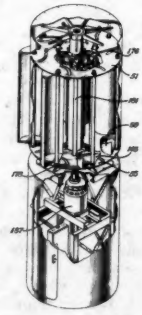
third means formed in the other of said first means and the second end of said at least one arm means adapted to be inserted in said second means in a radial direction of said rotor means for effecting a connection of said at least one arm means to said first means.

4,618,312

WIND OPERATED APPARATUS

Robert A. Williams, 2721 White Settlement Rd., Fort Worth, Tex. 76107

Filed Jan. 28, 1985, Ser. No. 695,726
Int. Cl.[4] F03D *7/06*
U.S. Cl. 416—119 **31 Claims**



1. A wind operated apparatus, comprising:

a frame,

support means for supporting said frame for rotation about a generally vertical axis,

an enclosing side wall supported by said frame for rotation about said generally vertical axis,

said enclosing side wall forming an interior chamber shielded from the wind,

a plurality of openings formed through said enclosing side

wall at spaced apart positions around said enclosing side wall,

a plurality of vane means supported by said frame at spaced apart positions around said enclosing side wall and near said enclosing side wall for causing said frame and said enclosing side wall to be rotated by the wind,

each of said vane means being associated with one of said openings,

each vane means being supported for pivotal movement relative to said frame about a pivot axis such that it may be moved through its associated opening between inward and outward positions on opposite sides of said enclosing side wall,

said pivot axes being located inward of said enclosing side wall,

cam means supported by said support means at said generally vertical axis,

a plurality of cam follower means coupled to said frame for rotation therewith and for engaging said cam means as said frame rotates,

the number of said cam follower means being equal to the number of said vane means,

each of said cam follower means being associated with one of said vane means, and

linkage means pivotally coupled to each of said cam follower means and to its associated vane means, for cyclically moving each of said vane means to its inward and outward positions as said frrame rotates such that on one side of said generally vertical axis said vane means are moved to their outward positions as said vane means are rotated by said frame to said one side and on the opposite side of said generally vertical axis said vane means are moved to their inward positions as said vane means are rotated by said frame to said opposite side.

4,618,313

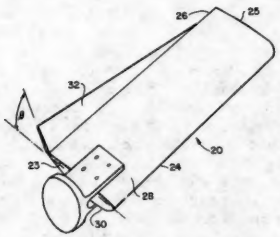
AXIAL PROPELLER WITH INCREASED EFFECTIVE DISPLACEMENT OF AIR WHOSE BLADES ARE NOT TWISTED

Antonio Mosiewicz, Milan, Italy, assignor to Cofimco S.r.l., Milan, Italy

Continuation-in-part of Ser. No. 228,972, Jan. 27, 1981, abandoned. This application Oct. 6, 1983, Ser. No. 539,382

Int. Cl.[4] B64C *11/18*

U.S. Cl. 416—237 **8 Claims**



1. An axial propeller comprising:

a blade with constant inclination angle along its whole length (untwisted) and having a leading edge and a trailing edge, an upper surface and a convex lower surface which extend between said leading and trailing edges, said lower surface having a curvature greater than that of said upper surface, said blade having a proximal end for securing to a hub and a distal end and having a constant cross-section between said ends; and means for increasing the effective displacement of air generated by said blade near said proximal end, said means for increasing comprising a tab secured to said trailing edge of said blade, extending upwardly and outwardly from said trailing edge and having its maximum width toward the proximal end of the blade, its minimum width toward the distal end of the blade, said tab forming an angle of between 10° and 70° with the blade and located on the blade upper surface and the maximum width of the tab being not greater than about 30% of the width of the blade.

4,618,314

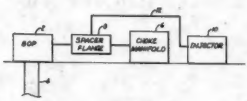
FLUID INJECTION APPARATUS AND METHOD USED BETWEEN A BLOWOUT PREVENTER AND A CHOKE MANIFOLD

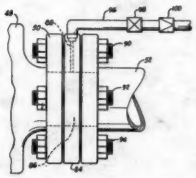
Charles D. Hailey, 11628 Burning Oaks Rd., Oklahoma City, Okla. 73150

Filed Nov. 9, 1984, Ser. No. 670,410

Int. Cl.[4] F04B *21/00;* **E21B** *33/00*

U.S. Cl. 417—53 **17 Claims**





1. An apparatus for pumping fluid into a blowout preventer through a first opening thereof and into a choke manifold through a second opening thereof, said apparatus comprising:

a base frame;

fluid container means, mounted on said base frame, for receiving the fluid to be pumped into said blowout preventer and said choke manifold;

pump means, mounted on said base frame, for pumping said fluid of said fluid container means through a flow inlet and an outlet of said pump means; and

spacer flange coupling means, connectible between said first and second openings, for coupling said outlet of said pump means with said blowout preventer and said choke manifold, said spacer flange coupling means including:

a flange body having a longitudinal opening defined therethrough for providing a flow path in line with said first and second openings, said flange body also having a lateral port defined therein outwardly from said longitudinal opening to an exterior surface of said flange body; and

conduit means for providing a flow conductor between said outlet of said pump and said lateral port of said flange body.

9. A method of injecting a fluid into a blowout preventer, connected to a well and having first valve means disposed within a choke flow line extending from said blowout preventer, and into a choke manifold, having second valve means disposed between an inlet adapted for connecting to said choke flow line and an outlet of said choke manifold, said method comprising the steps of:

connecting to said choke flow line and said inlet, between said first and second valve means, flow port means for providing a fluid communication path between said choke flow line of said blowout preventer and said inlet of said

choke manifold and for providing an injection port into said fluid communication path; and

pumping said fluid into said injection port so that said fluid is dispersed through said fluid communication path towards said first and second valve means.

4,618,315

SMALL FAN

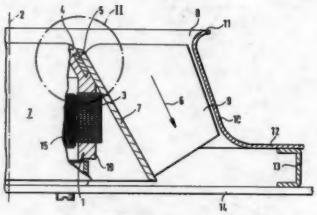
Georg Papst, St. Georgen, and Günter Wrobel, Villingen-Schwenningen, both of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co., St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 382,247, May 26, 1982, abandoned. This application Jan. 28, 1985, Ser. No. 694,912

Claims priority, application Switzerland, May 29, 1981, 3520/81

Int. Cl.[4] **F04B** *35/04;* **F04D** *29/02*

U.S. Cl. 417—354 **9 Claims**



1. A small electric motor fan having an air discharge side and an air suction side, comprising:

a housing having an outer wall conically widening in the direction of air flow;

a cup-shaped outer rotor, said rotor having an integral conically narrowed portion facing outwardly towrad the incoming air on the air suction side of said fan, said rotor being in the form a squirrel cage housing and including a squirrel cage lamination stack;

a conical member being generally hollow and having an inner surface and an outer surface, said conical member being separate from but mounted on said rotor around at least a portion of the periphery thereof for rotation coaxially therewith and formed and mounted in such manner that no portion thereof extends onto or pierces the radial plane of the portion of the rotor that faces outwardly toward the incoming air on the air suction side of said fan, said conical member widening coaxially in the direction of air flow, the outer surface of said conical member and the outer wall of said housing defining therebetween a conically directed air flow duct, said conical member further defining a dead space inwardly of its wide end between said member and said rotor;

fastening means engaging said conical member to said rotor; and

a plurality of blades mounted on the outer surface of said conical member in the air flow duct.

4,618,316

LIQUID END FOR A RECIPROCATING PUMP HAVING EASILY REMOVABLE VALVES AND VALVE RETAINERS

Robert Elliott, Two Ridgman Ct., Midland, Tex. 79703

Continuation of Ser. No. 373,021, Apr. 29, 1982, Pat. No. 4,477,236. This application Jul. 24, 1984, Ser. No. 633,849

The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.

Int. Cl.[4] **F04B** *21/00, 39/14*

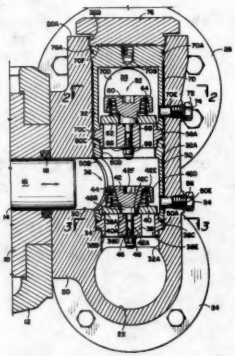
U.S. Cl. 417—454 **14 Claims**

1. An improved liquid end for use on a reciprocating pump in which the pump has a body providing a cylinder and a plunger reciprocating therein, a valve structure comprising:

a liquid end body having a lower liquid intake port, an upper exhaust port, and an intermediate plunger port between the intake and exhaust ports, the liquid end body being secured to the pump body with the plunger port in communication with the valve chamber, and the liquid end body being further defined by a vertical cylindrical valve chamber extending from the surface of the liquid end body, the cylindrical axis thereof being perpendicular the axis of the plunger, the lower end of the valve chamber communicating with said intake port, the upper end communicating with said exhaust port, and the intermediate portion communicating with said plunger chamber, the valve chamber having a reduced internal diameter portion adjacent the lower end providing a seating ledge, the valve chamber being defined by concentric enlarged diameter portions, each portion being slightly larger in internal diameter than the portion just below it;

an intake valve of external diameter less than said valve chamber smallest diameter port above said reduced internal diameter portion and positioned in said valve chamber in engagement with said seating ledge;

a lower tubular seat retainer of external diameter less than said valve chamber and being slidably received therein, the lower end of the lower seat retainer engaging said



intake valve and serving to hold it in fixed position, the lower seat retainer having an opening in the sidewall thereof in coincidence with said plunger chamber, the upper end portion of the lower seat retainer forming an annular seating surface having sealing engagement with one of said valve chamber concentric enlarged diameter portions;

an exhaust valve of external diameter less than said valve chamber and positioned in engagement with said lower retainer upper end;

an upper tubular seat retainer slidably received therein, the lower end of the upper retainer engaging said exhaust valve to hold it in fixed position and having openings in the sidewall thereof in coincidence with said outlet ports, the upper end portion of the upper seat retainer forming an annular seating surface having sealing engagement with one of said valve chamber concentric enlarged diameter portions, said lower and upper seat retainers each having a smaller diameter opening in the sidewall thereof spaced from said liquid end plunger chamber port and said exhaust port opening respectively, and wherein said liquid end body has threaded drain openings therein intersecting said valve chambers and in coincidence with said smaller diameter openings when said retainers are properly positioned within said liquid end;

means to close the upper end of said valve chamber and to

retain said upper seat retainer in secure engagement with said upper valve whereby said intake and exhaust valves may be of the same diameter and thereby optionally interchangeable and whereby said seat retainers may be removed from said valve chamber by short distance upward pull, the seat retainers thereafter entering into portions of said valve chamber having increased internal diameters;

a threaded alignment plug received in each said liquid end threaded drain openings and extending loosely into said small diameter cage openings to align said retainers in proper orientation in said liquid end body passages, and

wherein each of said intake and exhaust valves is in the form of a cylindrical valve seat having an upper and lower side, and having an integral enlarged diameter portion of external diameter less than said valve chamber and engageable with a said seating ledge, both the upper and lower surface providing valve sealing surfaces and having an axial opening therethrough and liquid passageway opening therethrough spaced from said axial opening;

a cylindrical valve disc member having an upper and lower sealing surface and having an axial opening therethrough;

a cylindrical valve guide stem member having a reduced diameter portion received and removably secured to said valve seat axial opening and having an upper enlarged diameter portion engaging the upper surface of said valve seat and slidably receiving said valve disc, the valve guide having an upper further enlarged diameter portion limiting the upward travel of said valve disc and providing spring retaining means; and

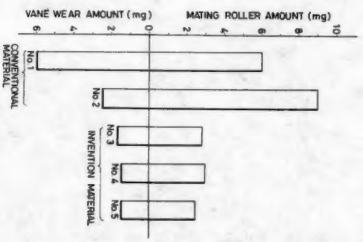
compression spring means receiving between said valve guide stem upper portion and said valve disc to resiliently urge said valve disc into sealing engagement with said valve seat sealing surface.

4,618,317

ROTARY TYPE FLUID COMPRESSOR

Michiyoshi Matsuzaki, Saitama, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,665
Claims priority, application Japan, Nov. 30, 1982, 57-208567
Int. Cl.⁴ F04C *15/00*
U.S. Cl. 418—63 **4 Claims**



1. A rotary-type fluid compressor, comprising:

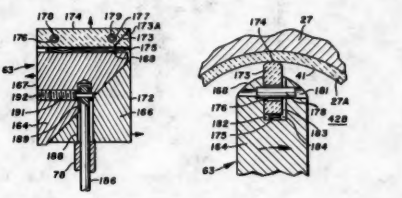
a housing having a vane groove therein; and a vane fitted in the vane groove, and a member mating with said vane, the vane being formed of a soft nitrided hardened steel material comprising 0.50 to 1.30% C by weight, 11.0 to 20.0% Cr by weight, with the balance being predominantly Fe; and said mating member being formed of cast iron containing 0.10 to 6.00% carbide, the cast iron having a graphite configuration and a grade selected from the group consisting of ASTM grades A, D, and E, the iron having the structure of tempered martensite and a Rockwell C hardness (HRC) in the range of 40 to 55.

4,618,318

VANE AND SEAL ASSEMBLY

Craig N. Hansen, Minnetonka, Minn., assignor to Hansen Engine Corporation, Minnetonka, Minn.

Division of Ser. No. 447,448, Dec. 6, 1982, Pat. No. 4,507,067.
This application Mar. 25, 1985, Ser. No. 715,900
Int. Cl.⁴ F01C *1/00, 19/04, 19/08*
U.S. Cl. 418—111 **20 Claims**



1. A vane and seal assembly for a rotary device having a housing with spaced side walls having inside wall surfaces and an inside circumferential wall surrounding an annular chamber and a rotor located within the chamber rotatably mounted on the housing, said rotor having at least one generally radial slot slidably accommodating the vane and seal assembly comprising: a first vane segment having a side wall engageable with one inside wall surface, a second vane segment having a side wall engageable with the other inside wall surface, said first and second vane segments having diagonal engaging surfaces and generally parallel side walls allowing the first and second vane segments to move in opposite lateral directions relative to each other in sliding and sealing engagement with sid inside wall surfaces, means connecting the vane segments to said side walls, said first vane segment having a groove in the outer end thereof extended along the length thereof, seal means located in said groove, said seal means having an outer transverse face locatable in sealing engagement with said inside circumferential wall, means mounting the seal means on the first vane segment, said means allowing limited radial movement of the seal means relative to the first vane segment, and biasing means mounted on the first vane segment for biasing the seal means in an outward direction into engagement with the inside circumferential wall of the housing, said groove having a width wider than the width of the seal means and depth greater than the radial dimension of the seal means whereby gas under pressure in said chamber biases the outer transverse face of the seal means into sealing engagement with the inside circumferential wall.

4,618,319

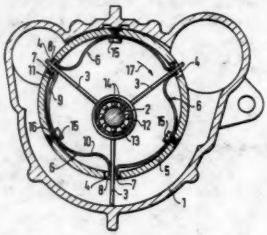
VANE-TYPE COMPRESSOR HAVING RESILIENT SLOT SEALS

Franz Kochannek, Schwabach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 1, 1985, Ser. No. 794,241
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1984, 3442225
Int. Cl.⁴ F04C *27/00*
U.S. Cl. 418—136 **9 Claims**

1. A vane-type machine comprising a rotor housing, a tubular slotted rotor supported for rotation in said housing, a set of radial vanes arranged in said rotor and passing with a play through slots of the latter, and means for resiliently sealing said vanes in said slots, said sealing means including a plurality of

leaf springs extending in said rotor between consecutive slots, adjacent end portions of said springs projecting into corresponding slots to resiliently engage opposite sides of said vanes.

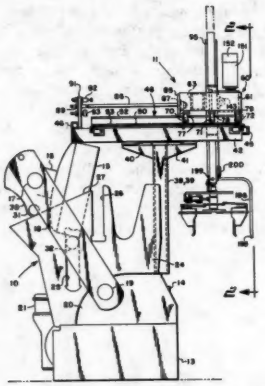


4,618,320

TIRE PRESS AND LOADER

Anand P. Singh, Youngstown, Ohio, assignor to NRM Corporation, Columbiana, Ohio

Filed Dec. 4, 1985, Ser. No. 804,460
Int. Cl.[4] B29H *5/02*
U.S. Cl. 425—38 **27 Claims**



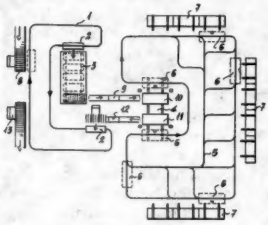
1. In combination a tire press including side-by-side fixed bottom mold sections, vertically movable side-by-side top mold sections, thus movable to open and close the press, and a loader operative to place uncured tires on or near the bottom mold sections when the press is open, said loader comprising a carriage frame movable fore and aft of the front of the press, means to move said carriage frame fore and aft, vertically movable posts mounted on said frame, a loader chuck on the lower end of each said post, said chucks and posts being aligned with pick-up positions in the fore position of the carriage, and being aligned with the bottom mold sections in the aft position of the carriage, and squaring mechanism means to move said posts vertically in unison thus to load uncured tires in the molds of the press as aforesaid.

4,618,321

FOAMING SYSTEM IN PARTICULAR FOR FOAMING REFRIGERATOR FURNITURE

Silvano Claisen, Abbintegrasso, Italy, assignor to Perros Industriale S.p.A., Milan, Italy

Filed Jun. 26, 1985, Ser. No. 749,318
Claims priority, application Italy, Jul. 2, 1984, 21715 A/84
Int. Cl.[4] B29C *1/00, 5/04;* B29D *27/04*
U.S. Cl. 425—88 **16 Claims**



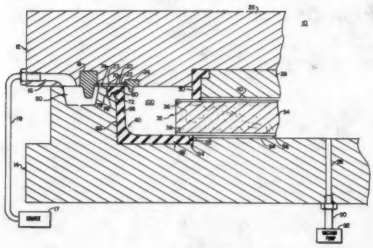
1. A system for foaming in particular refrigerator furniture pieces, which comprises a first path for the translation of first means for independently carrying furniture pieces, pre-heating means for pre-heating said furniture pieces, on operating station for handling masks, a second path for the translation of second means for independently carrying masks and at least a stocking region for stocking said masks and the related furniture pieces contained therein.

4,618,322

REACTION INJECTION MOLDING SYSTEM WITH FINGER GATE

Charles A. Lagasse, Newburyport, Mass., assignor to PlasTek Corporation, Newburyport, Mass.

Continuation-in-part of Ser. No. 507,336, Jun. 24, 1983, abandoned. This application Nov. 8, 1984, Ser. No. 669,905
Int. Cl.[4] B29C *33/12*
U.S. Cl. 425—129 R **11 Claims**



1. An injection molding machine comprising:

a core and a permanent cavity at least a portion of which is elastomeric, said elastomeric portion including a first part defining at least a portion of the floor of said cavity, a second part defining at least a portion of the wall of said cavity, and a third part defining at least a portion of the upper edge of the wall and extending outwardly therefrom to form at least a portion of the top of said cavity, the cavity floor having an interior portion which is not elastomeric and said first part of said elastomeric portion defining the periphery of the cavity floor for receiving an insert at its inner end proximate said interior non-elastomeric portion of the cavity floor; and

a finger gate for interconnecting said cavity with a source of

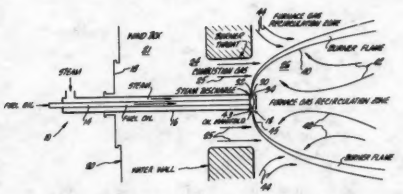
molding medium, said finger gate including a plurality of spaced fingers on said core transverse to the edge of the wall and aligned with the flow of the molding medium into said cavity for engaging said third part of said elastomeric portion and securing said elastomeric portion against said core to prevent disruption of said elastomeric portion as molding medium is introduced to said cavity.

4,618,323

METHOD AND BURNER TIP FOR SUPPRESSING EMISSIONS OF NITROGEN OXIDES

Mansour N. Mansour, Hacienda Heights, Calif., assignor to Southern California Edison, Rosemead, Calif.

Division of Ser. No. 122,690, Feb. 19, 1980, Pat. No. 4,505,665.
This application Aug. 6, 1984, Ser. No. 638,295
Int. Cl.[4] F23C *5/08*
U.S. Cl. 431—177 **40 Claims**



1. A burner tip for burning of a liquid fuel in a combustion chamber containing a flame while suppresing the production of oxides of nitrogen, the combustion chamber including an opening, and means for introducing an oxygen containing combustion gas thereinto through said opening, the burner tip being located in the path of the oxygen containing gas as it passes through said opening and comprising:

(a) a fuel port and means for ejection of the liquid fuel without any atomization gas through said fuel port into the combustion chamber, the burner tip having a longitudinal axis and the fuel port being oriented so that the fuel is ejected into the combustion chamber at an angle generally perpendicular to the longitudinal axis of the burner tip and to the angle of introduction of the combustion gas; and

(b) at least two gas ports in the burner tip, and means for introducing a control gas into the combustion zone at an angle generally perpendicular to the longitudinal axis of the burner tip and the angle of introduction of the combustion gas for controlled atomization of the liquid fuel, the gas ports being on axially opposite sides of the fuel port and axially spaced apart from the fuel port, at least one of the gas ports being axially spaced apart from the fuel port by at least 0.3 inch and no more than about 12 inches, said gas ports being oriented to direct gas in the same general direction as said fuel port.

4,618,324

CENTRI-LEVER ORTHODONTIC APPLIANCE

Philip J. Nord, 5213 SE. 30th, No. 210A, Portland, Oreg. 07202

Filed Jan. 28, 1985, Ser. No. 695,565
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—19 **6 Claims**

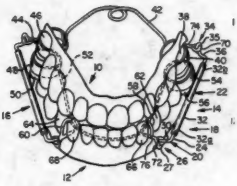
1. An intraoral orthodontic appliance extending between the teeth of the upper jaw and the teeth of the lower jaw comprising:

an elongate extensible-contractable mechanism positioned laterally outwardly of the teeth in the upper and lower jaws,

a ring mounted on the lower jaw and a ring mounted on the upper jaw,

a first planar loop engaging one of said rings adjacent one end of said mechanism and means mounting said loop on said mechanism with such located laterally inwardly of the mechanism and outwardly of the teeth and in a substantially vertical plane, and

a second planar loop engaging the outer ring adjacent the



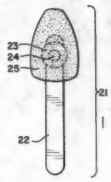
other end of said mechanism and means mounting said second loop on said mechanism with such located laterally inwardly of the mechanism and outwardly of the teeth and in a substantially vertical plane.

4,618,325

CUSTOM DENTAL SHADE GUIDE TAB

Gerald K. Appelle, 245 E. 87th St., New York, N.Y. 10128

Filed Mar. 18, 1985, Ser. No. 713,182
Int. Cl.[4] A61C *19/10*
U.S. Cl. 433—26 **11 Claims**



1. An assembly for the custom formation of a dental shade guide tab comprising a hollow transparent substantially closed mold and stick-like handle, said substantially closed mold having an opening in which selected raw tooth filling restorative material is located to harden and cure in the shape of said mold, said handle having anchor means projecting through said opening and into anchoring engagement with the restorative material, and said mold being separable from said restorative material and said handle.

4,618,326

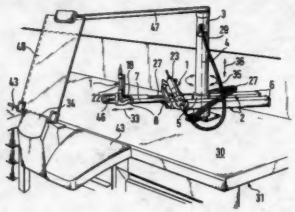
EQUIPMENT STAND FOR DENTAL IMPLEMENTS

Helmut Schmidt; Anton Bodenmiller, both of Leutkirch, and Alfred Straka, Isny, all of Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach/Riss, Fed. Rep. of Germany

Filed May 10, 1985, Ser. No. 733,121
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420566
Int. Cl.[4] A61G *1/14;* A01C *15/00*
U.S. Cl. 433—79 **18 Claims**

1. In an equipment stand for the deposition of dental implements during the non-use of said implements, a stationary support column; holders for said implements being mounted on said support column, said holders being linearly reciprocable in a horizontal plane relative to said support column and pivotable about the longitudinal axis of said support column, the improvement comprising: said holders being arranged on a

turning sleeve which is rotatable about the support column, said holders being pairwise diametrically located opposite each



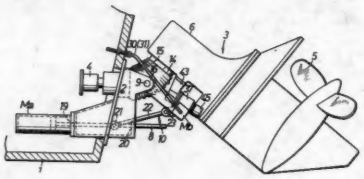
other on said support column, and said holders with said turning sleeve are vertically adjustable in height.

4,618,327

STEERING STRUCTURE FOR SHIP PROPELLING DEVICE

Toshio Kitai, Nagoya, Japan, assignor to Kabushiki Kaisha Kitai Tekkosho, Nagoya, Japan

Filed Sep. 19, 1984, Ser. No. 652,235
Claims priority, application Japan, Sep. 19, 1983, 58-172709
Int. Cl.[4] B63H *5/13*
U.S. Cl. 440—53 **4 Claims**



1. A steering structure for a ship propelling device, comprising:

a support member which is secured to a hull and is adapted to support a body of the ship propelling device mounted outboard such that said body is wholly pivotable about a pivot shaft extending horizontally as well as about an axis orthogonal to an axis of said pivot shaft;

a universal joint which connects between a drive shaft connected to a drive source provided inboard and an input shaft of said ship propelling device;

a vertically driving means which is disposed inboard and is adapted to pivot the body of said ship propelling device about said pivot shaft;

a link mechanism which connects together said vertically driving means and said body of the ship propelling device and which allows the body to perform a vertical pivot motion in response to a horizontal linear motion of the driving means;

a hydraulically operated turning driving means which is provided on said support member and is operatively connected with said body so as to pivotally drive the whole body about the axis orthogonal to the axis of said pivot shaft;

a swing lever means pivotally supported on the support member through said pivot shaft and extending in a radial direction of the pivot shaft, said swing lever means having a free end to which is secured said turning driving means, said turning driving means including a box member for supporting a steering shaft integrally formed on the body for rotation around the axis orthogonal to the axis of the pivot shaft; and

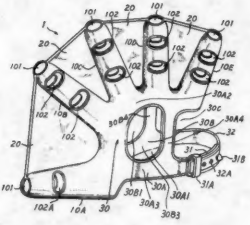
said body of the ship propelling device being provided with a pair of upper and lower support means projected frontwardly from a front surface of the body, said steering shaft being clamped and held between said support means against relative rotation.

4,618,328

SWIMMING GLOVE

Hsin-Hsiung Chi, No. 387, Ta Nan Road, Shih Lin District, Taipei, Taiwan

Continuation-in-part of Ser. No. 647,843, Sep. 6, 1984, abandoned. This application Jan. 2, 1986, Ser. No. 815,814
Int. Cl.[4] A63B *31/04*
U.S. Cl. 441—57 **2 Claims**



1. A swimming glove comprising five finger sleeves corresponding with the thumb and four fingers of a wearer of the swimming glove, said five finger sleeves having a web in between each two neighboring finger sleeves, each finger sleeve having an end opening and at least one pair of opposite side openings to correspond with a finger joint to enable easy bending of the wearer's fingers;

a glove body integrally formed with said finger sleeves and webs, said glove body having a first side and an opposite, symmetric second side respectively provided with first and second central openings, and a third opening along one edge part of said glove body; and a pair of fastening straps integrally formed with said glove body and arranged to extend traversally across the wearer's hand and to be tied around the side edge of the wearer's hand opposite the thumb.

4,618,329

WATER SLIDERS

Remy Celez, 9112 W. Fort St., Detroit, Mich. 48209

Continuation-in-part of Ser. No. 515,868, Jul. 21, 1983, abandoned. This application Jul. 31, 1984, Ser. No. 636,167
Int. Cl.[4] A63C *15/00*
U.S. Cl. 441—76 **2 Claims**

1. A pair of water sliders for floating, walking or sliding on the surface of water, each water slider comprising:

a shell means for enclosing a float means, a stiffener means, a tail means and a foot strap means;

said shell means having an opening at the rear only;

said float means enabling the wearer to float on the surface of the water and being made of a slab of foam;

said stiffener means for strengthening the water slider, and being located between the upper part of the shell means and the upper part of the float means;

said tail means being used for propelling and steering and consisting of a hollow forward part and an open rear part;

said hollow forward part fitting snugly inside of the rear of the shell means;

said open rear part consisting of a first set of two flat panels, placed at an angle to each other, one panel covering the opening at the rear part of the float means, the other panel rising above the top of the shell means, the intersection of the two panels forming a line which also intersects the upper edge of the opening at the rear of the shell means;

said open rear part also consisting of a second set of two flat panels, each panel being perpendicular to and on opposite sides of the set of first flat panels, two edges of each of said second set of two flat panels being connected to one edge each of first set of two flat panels, one edge each of each of the second set of two flat panels being connected respectively to each of the sides of the rear opening of the shell means;

said open rear part forming an opening away from the rear part of said water sliders, and facing backwardly, such as to trap water and form a resistance to rearward movement of the water slider;

said foot strap means holding the wearer's foot.

4,618,330

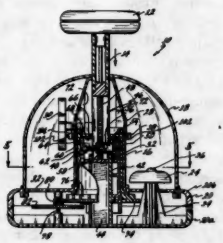
TOY AMUSEMENT DEVICE

Akira Abe, Tokyo, Japan, assignor to Tomy Kogyo Co. Inc., Tokyo, Japan

Filed Jan. 22, 1985, Ser. No. 693,842

Int. Cl.[4] A63H *1/00*

U.S. Cl. 446—236 **19 Claims**



1. A toy which comprises:

a housing;

first and second members located on said housing;

said first member shaped as a surface of rotation having a hollow interior and open ends opening into said hollow interior, said first member rotatively mounted on said housing;

said second member being elongated in shape and located on said housing so as at least a portion of said second member is located within the hollow interior of said first member with at least a portion of said second member extending out of one of said ends of said first member, said second member linearly movable in and out of one of said ends of said first member;

first gear means located on said first member;

second gear means located on said second member;

connecting gear means located on said housing in operative association with both said first and said second gear means so as to transfer linear motion of said second member into rotational motion of said first member;

output means for producing a mechanical output, said output means independent of said first member, said output means movably located on said housing in operative association with said first member whereby rotational motion of said first member moves said output means on said housing;

said housing includes an upstanding element shaped as a surface of rotation mimicking the shape of the surface of rotation of said first member, said upstanding element sized and shaped so as to fit within the interior of said first member whereby said first member rotates around said upstanding element;

said upstanding element further including an opening located through the interior of said upstanding element, said opening sized and shaped so as to contain at least a portion of said second member;

said first member rotating around said upstanding element in response to movement of said second member with respect to said upstanding element.

4,618,331

VARIABLE RATIO TRANSMISSION

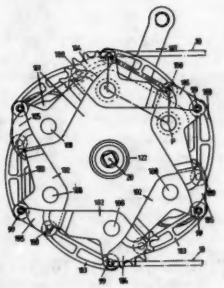
Michel Deal, Villers, 42460 Cunzier, France

Filed Dec. 14, 1983, Ser. No. 561,204

Claims priority, application United Kingdom, Dec. 14, 1982, 8235574

Int. Cl.[4] F16H *9/02*

U.S. Cl. 474—49 **14 Claims**



1. A rotary drive device for a variable ratio transmission mechanism including an endless flexible tension element, the device comprising a rotary support carrying a plurality of angularly spaced contact elements for the tension element, the contact elements being movable to vary their radial displacement from the axis of said support, and including resilient means urging said contact elements outwards, an input drive member, which is capalbe of limited rotation relative to said support, and control means arranged to exert a resisting force on the movement of the contact elements, said control means being responsive to changes in the torque transmitted between said input drive member and said rotary support, and arranged to vary a braking force restraining inward movement of said contact elements, in dependence on the torque applied by said input drive member.

4,618,332

DERAILLEUR FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed May 13, 1985, Ser. No. 733,600

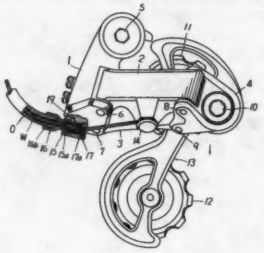
Claims priority, application Japan, May 21, 1984, 59-74705[U]

Int. Cl.[4] F16H *9/00*

U.S. Cl. 474—80 **5 Claims**

1. In a derailleur for a bicycle which is provided with a linkage mechanism comprising a base member, a pair of linkage members each pivotably connected on one end to said base member, and a movable member having a chain guide, said linkage members each being pivotably connected on another end to said movable member; a fixture for a control wire to operate said linkage mechanism; and a holder for an outer sheath for guiding said control wire; said fixture being mounted on one of two members movable relative to each other among said base member, said linkage members and said movable member of said linkage mechanism, and said holder

being supported to the other of said two members, the improvement wherein said derailleur further comprises a support member including a threaded bore in which said holder is screwably engaged, and a guide fixed to a side of said support member at which said control wire is drawn out therefrom away from a position at which said holder is supported by said



support member, said guide comprising a guide bore for guiding said control wire from an exit of said holder to said fixture when said control wire is actuated, said guide being formed of a material having a relatively high wear resistance and a relatively low coefficient of friction and having means for causing said control wire to avoid contact with an edge of said holder at said exit thereof and to contact said guide bore.

4,618,333

DERAILLEUR FOR A BICYCLE

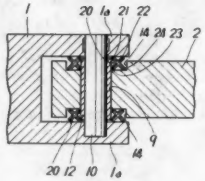
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed May 20, 1985, Ser. No. 735,668

Claims priority, application Japan, May 26, 1984, 59-77506[U]

Int. Cl.⁴ F16H *9/00*

U.S. Cl. 474—80 **8 Claims**



1. A bicycle derailleur, comprising a base member, a movable member, and a pair of linkage members interposed between said base member and said movable member and supporting said movable member such that said movable member is movable with respect to said base member, one of (i) said base member and said movable member and (ii) each of said linkage members having a pair of mounting walls, the other of said base member and said movable member and each of said linkage members comprising an insertion portion inserted between said mounting walls, said mounting walls having therebetween a link pin passing through said insertion portion inserted between said mounting walls, one of each of said mounting walls and a said insertion portion inserted therebetween having annular recesses disposed around said link pin, said annular recesses each having therein a sealing member to restrain water from entering between said mounting wall and said inserting portion into a space around said link pin.

4,618,334

BELT PULLEY AND METHOD OF MAKING THE SAME

Joseph P. Miranti, Jr., Porter Township, Christian County, Mo., assignor to Dayco Corporation, Dayton, Ohio

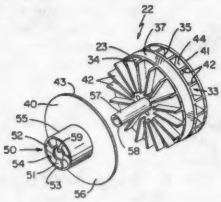
Division of Ser. No. 383,855, Jun. 1, 1982, Pat. No. 4,530,680.

This application Jul. 22, 1985, Ser. No. 757,561

The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.

Int. Cl.⁴ F16H *57/04*

U.S. Cl. 474—93 **2 Claims**



1. In a belt pulley having a hub and a peripheral groove for receiving part of an endless belt therein that is to drive said pulley or be driven thereby whereby said pulley is adapted to be rotated about the axis of said hub, said pulley having means defining at least one passage means provided with an inlet adjacent said hub and an outlet adjacent said peripheral groove whereby fluid passing through said passage means from said inlet to said outlet thereof will tend to cool said pulley and/or said belt as said pulley rotates about said axis, the improvement comprising a rotatably operable fluid flow forcing duct-like member carried by said pulley so as to be rotated and thereby operated in unison with said pulley and being disposed upstream from said inlet for forcing fluid into said inlet and thus through said passage means and said pulley means as said pulley and said fluid flow forcing means rotate about said axis, said duct-like member having opposed ends and at least one fan blade, one of said ends of said duct-like member being disposed adjacent said inlet of said passage means, said blade being disposed in said duct-like member adjacent the other of said ends thereof.

4,618,335

TENSION-ADJUSTING DEVICE FOR DRIVING BELT

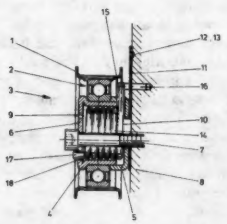
Manfred Brandenstein, Eussenheim; Roland Haas, Hofheim; Gerhard Herrmann, Schweinfurt; Wolfgang Friedrich, Schweinfurt, and Ludwig Edelmann, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 15, 1984, Ser. No. 660,968

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1983, 8330695[U]

Int. Cl.⁴ F16H *7/08, 7/10*

U.S. Cl. 474—112 **6 Claims**



1. In a tension-adjusting device for a driving belt having an

axis of swivel and comprising a tension roller securely mounted on a machine by means of a tightened mounting bolt, said tension roller having a support, said axis of swivel being radially displaced from the rolling axis of said tension roller, the improvement comprising an engagement arrangement fastened to said support for coupling said support and said machine frame, said engagement arrangement enabling stepwise swiveling movement of said tension-adjusting device relative to said machine frame when said mounting bolt is slightly loosened and comprising resilient means adapted to flex in a direction substantially parallel to said axis of swivel, said resilient means having means for form-locking with any one of a plurality of receiving means formed at predetermined swivel positions on said machine frame.

4,618,336

BELT STRETCHING MECHANISM

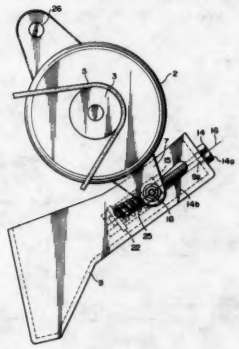
Masahiro Isobe; Sumio Okazaki, and Hideki Tanaka, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 1, 1985, Ser. No. 707,234

Claims priority, application Japan, Mar. 2, 1984, 59-029372

Int. Cl.[4] F16H *7/14*

U.S. Cl. 474—133 **10 Claims**



1. A belt stretching mechanism to adjust the tension of a belt wound around pulleys, the position of one of said pulleys being adjustable by moving a stay, comprising:

an adjust bar with an elongated guide-hole extending in an arc along an axis;

an adjust bolt whose head contact-engages said adjust bar, said contact-engagement supporting said adjust bolt, the end of said adjust bolt opposite said head being freely moveable with respect to said adjust bar;

a slider through which said adjust bolt slidably extends;

a nut extending in the longitudinal direction of said adjust bolt and threaded onto said adjust bolt;

a slide cam formed at the end of said nut;

a spring interposed between said slider and said slide cam and urging said slider toward said head of said adjust bolt;

a spring plate extending from said slider parallel to the axis of said adjust bolt and being slidably engageable with said slide cam until a predetermined force is placed on said spring; and

stay-fastening bolt means, attached to said slider and extending through said guide hole of said adjust bar for fastening said stay together with said slider to said adjust bar, the axis of said stay-fastening bolt means and the axis of said adjust bolt passing through a point along said axis of said guide-hole, said adjust bolt, adjust bar, nut and stay-fastening bolt means being arranged to place said adjust bolt under tension as said adjust bolt is turned to stretch said belt, the axis of said adjust bolt extending substantially tangential to said axis of said elongated guide-hole when said spring is under said predetermined force.

4,618,337

V-BELT ASSEMBLY FOR TRANSMITTING POWER

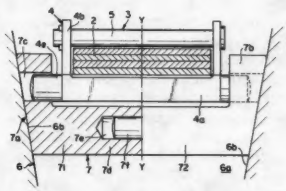
Susumu Okawa, Numazu, and Yasunobu Jufuku, Susono, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 19, 1984, Ser. No. 662,617

Claims priority, application Japan, Oct. 26, 1983, 58-199240; Oct. 26, 1983, 58-164548[U]; Oct. 26, 1983, 58-164549[U]; Nov. 30, 1983, 58-183823[U]; Dec. 2, 1983, 58-185785[U]; Dec. 2, 1983, 58-185786[U]; Dec. 2, 1983, 58-185787[U]; Dec. 2, 1983, 58-185788[U]; Dec. 2, 1983, 58-185790[U]

Int. Cl.[4] F16G *5/16, 5/18, 5/22*

U.S. Cl. 474—201 **43 Claims**



1. A V-belt assembly for transmitting power, comprising:

a V-belt assembly trained over a V-belt wheel;

a flexible endless belt;

a plurality of suspension members slidably mounted on the endless belt in a longitudinal direction thereof and which further comprises a pin member and a U-shaped member connected to said pin thereof; and

a plurality of U-shaped transmission pieces separated from said U-shaped member, having side surfaces corresponding to side walls of a V-shaped groove of the V-belt wheel and supported swingably by the suspension members, respectively.

4,618,338

LINK CHAIN FOR A VARIABLE RATIO CONE PULLEY TRANSMISSION

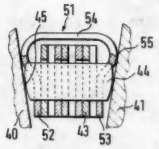
Manfred Rattunde; Herbert K. Steuer, and Hans-Jürgen Wolf, all of Bad Homburg, Fed. Rep. of Germany, assignors to Reimers Getriebe AG, Zug, Switzerland

Filed Mar. 11, 1985, Ser. No. 710,141

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1984, 3413384

Int. Cl.[4] F16G *1/21*

U.S. Cl. 474—245 **16 Claims**



1. Link chain for a variable transmission ratio cone pulley transmission having

a plurality of chain link elements (1, 15, 43) extending—in the running direction of the chain—longitudinally of the chain,

the chain link elements being formed with openings (2) therein;

rocker elements (3, 16, 44) extending transversely of the

chain, fitted into the openings, forming hinge joints for the link elements, and having lateral end surfaces (45) dimensioned and shaped for engagement with facing surfaces of the cone pulleys (12; 40, 41) of the transmission,

said chain further comprising, in accordance with the invention,

means to reduce operating noise level of the link chain in the transmission, primarily resulting from sequential engagement of the end surfaces (45) of the rocker elements (3, 16, 44) with the facing surfaces of the cone pulleys (12; 40, 41) including

frame bodies extending transversely of the chain and located between two hinge joints formed by the rocker elements (3, 16, 44) and surrounding the chain links at least over a major extent of the chain links

lateral resilient engagement surface formed on the frame bodies and located laterally adjacent the sides of the outermost chain link elements for resilient and frictional engagement with the facing surfaces of the cone pulleys (12, 40, 41) of the transmission,

said frame bodies being retained on the chain by force engagement with at least one of said elements

to reduce the spacing of surfaces formed on the chain which, in operation, contact facing surfaces of the cone pulleys to only the gap between the lateral end surfaces (45) of the rocker elements a... the lateral engagement surfaces of the frame bodies.

4,618,339

CONVEYING CONTINUOUS FILTER MATERIAL

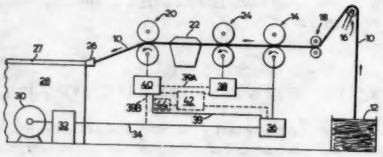
Hugh M. Arthur, and Graham H. Bates, both of High Wycombe, United Kingdom, assignors to Molins PLC, Great Britain

Filed Jul. 30, 1984, Ser. No. 635,928

Claims priority, application United Kingdom, Aug. 2, 1983, 8320817

Int. Cl.[4] B31C *13/00*

U.S. Cl. 493—4 **19 Claims**



16. Apparatus for conveying continuous filter material of the tobacco industry between a source of said material and a rod-making machine, including first conveying means for withdrawing material from said source, a conditioning station arranged to receive material from said first conveying means, driven second means for receiving material from the conditioning station and for feeding it towards the rod-making machine, means for operating the first conveying means at a predetermined first speed related to the speed of the rod-making machine, and means for varying the tension of material passing through the conditioning station, said varying means including control means for varying the speed of the second conveying means independently of that of the first conveying means.

4,618,340

APPARATUS FOR THE RECEIVING PACKING AND TRANSFERRING OF SHEET MATERIAL

Luciano Meschi, Corso Amedeo 73, 57100 Livorno, Italy

Filed May 4, 1983, Ser. No. 491,412

Int. Cl.[4] B05B *1/14*

U.S. Cl. 493—13 **31 Claims**

1. An apparatus for receiving and forming a package of cut piled sheets, the sheet material being received by the apparatus as a continuous strip composed of individual single sheets joined to an adjacent sheet and delineated therefrom by means of separation lines, comprising:

a fixed frame;

roller feeder means supported by said frame upstream thereof for advancing an oncoming continuous strip along a path in a controlled manner;

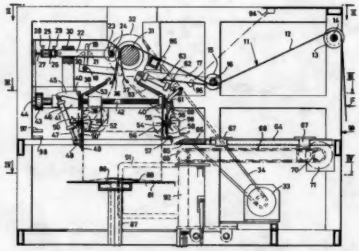
a sheet receiving plate together with means for the controlled positioning thereof carried by said frame downstream thereof for receiving the sheets after passing through said roller feeder means;

guiding means interposed between said roller feeder means and said sheet receiving plate for receiving, guiding and vertically directing the continuous strips towards said receiving plate on which the individual sheets are piled up in an accordian-like configuration;

means between said guide means and said receiving plate for temporarily holding the strip being piled up onto said receiving plate at a predetermined pile height;

means associated with said guide means for engaging the strip coming from said guide means and for accompanying the strip for the piling up thereof into said accordian-like configuration;

means between said guiding means and said receiving plate for temporarily separating and supporting the strip coming from said guiding means and advancing to said receiving plate, said temporarily separating means including at



least one horizontal plate interposable between adjacent strips after leaving said guiding means slidable between a retired position and an operative position;

cutting blade means mounted proximate to said at least one horizontal plate and movable together therewith for engaging one edge formed by the accordian shaped folded strip immediately below said temporarily separating and supporting means, said cutting blade means including a blade movable between a resting position in which said blade does not protrude from said plates and an operative position in which said blade protrudes from said plates;

a driving jack and two rigid bars fastened to said blade, said bars being driven by said jack for the resting and said operative positions;

first detecting means proximate to said roller feeder means for detecting the presence of the strip in said roller feeder means upstream of said apparatus;

second detecting means along said path downstream of said first detecting means for measuring the length of the strip passing through said roller feeder means;

third detecting means associated with said receiving plate for detecting the accumulation level of the strip folded as an accordian onto said receiving plate; and

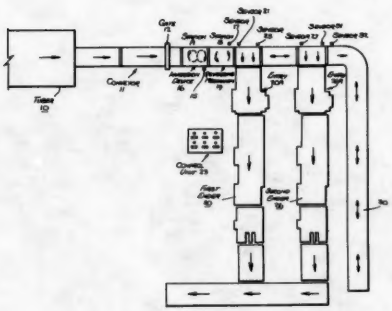
transferring means for the removal of a package of piled sheets from said receiving plate formed after the sheets are separated from the oncoming strip, and formed into packaged piles on an operative surface of said receiving plate.

4,618,341

TUBE POSITIONING AND TRANSFER SYSTEM

Steve A. Oldham, Sandy, and Ronald T. Picotte, Murray, both of Utah, assignors to Champion International Corporation, Stamford, Conn.

Filed Oct. 11, 1984, Ser. No. 659,707
Int. Cl.[4] B31B *1/00*
U.S. Cl. 493—14 14 Claims



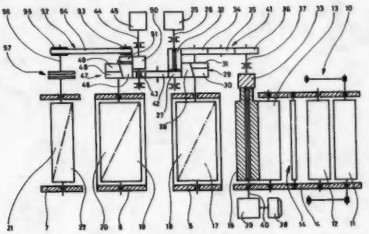
1. A tube transfer system of the class described comprising:
means for forming and stacking a hand of tubes;
first and second enders for closing and sealing one end of each tube;
conveyor means for transporting said hand of tubes from said forming and stacking means to said enders;
a by-pass section for transporting said hand beyond said enders, the second ender being disposed between said first ender and said by-pass section;
means for sensing when said first and second enders cannot accept tubes;
means responsive to said sensing means for causing the hand of tubes to be transported to said second ender when said first ender cannot accept tubes and to said by-pass section when said second ender cannot accept tubes; and
means for reversing the direction of transport of said by-pass section when the system is not supplied with tubes from said means for forming and stacking a hand of tubes to transport the hand from said by-pass section to said second ender when said second ender can accept tubes and to said first ender when said second ender cannot accept tubes.

4,618,342

MACHINE FOR PROCESSING WEB MATERIAL

Edouard Borel, Corcelles-Chavornay, Switzerland, assignor to Bobst SA, Lausanne, Switzerland

Filed Nov. 20, 1985, Ser. No. 799,930
Claims priority, application Switzerland, Nov. 21, 1984, 05566/84
Int. Cl.[4] B31B *1/10, 1/18, 1/25*
U.S. Cl. 493—30 8 Claims



1. In a machine for processing web material comprising a feeding station, a creasing station provided with rotatable tools, a cutting station with rotatable tools, a stripping station with rotatable tools, a delivery station and drive means for rotating the rotatable tools, the improvements comprising each of the stations with rotatable tools including a frame having two lateral frame members, each lateral frame member having a groove, a drive pinion of the drive means being mounted on one of the two lateral frame members adjacent the groove, each of said grooves receiving a lower bearing block and an upper bearing block separated by a thickness plate, said upper and lower bearing blocks mounting upper and lower rotatable tools with one of the tools having a pinion in driven engagement with the drive pinion of the station, said bearing blocks having identical outside shapes regardless of the size of the rotatable tool, locking means being provided on each of the frame members for providing a locking pressure to urge the upper and lower bearing blocks downwardly with the lower bearing block engaging the lower face of the groove, said locking means including jam-preventing means for releasing the locking pressure on the bearing blocks in response to a predetermined pressure being applied to the rotatable tools; and said drive means having a single drive motor directly connected through a shaft to the drive pinion of one of said stations with rotatable tools, said drive pinion being connected by a first drive train to a differential means having an output connected to a feed roll of the feed station, said differential means receiving an input from a correction motor for varying the rate of feed of the web to the stations having rotatable tools, said drive pinion being connected by a second drive train to the drive pinion of an adjacent station having rotatable tools, said second drive train including an angular phase means for setting the phase between stations, said adjacent station having braking means connected to a pinion acting on the gears of its rotatable tools and a third drive train connecting the second station to the stripping station, said stripping station having an angular phase means for setting the phase between its upper and lower tools.

4,618,343
APPARATUS FOR PERITONEAL DIALYSIS

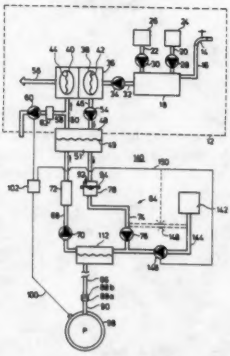
Hans-Dietrich Polaschegg, Oberursel, Fed. Rep. of Germany, assignor to Fresenius AG, Bad Homburg, Fed. Rep. of Germany

Filed Sep. 12, 1984, Ser. No. 649,873

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1983, 3333362

Int. Cl.⁴ A61M *1/28*

U.S. Cl. 604—29 **29 Claims**



21. A peritoneal dialysis apparatus comprising:

at least one dialyzer with a membrane dividing a space therein into a first chamber and a second chamber,

said first chamber being in a first circuit connected with a single lumen catheter means and a storage means and comprising a means for supplying a dialysis fluid, and

said second chamber being connected via a second circuit with a means for preparing said dialysis fluid,

said second circuit comprising pump means and a dialysis filter divided by a membrane into a first chamber and a second chamber,

said first chamber of said dialysis filter being in said first circuit, and

said second chamber of said dialysis filter being connected with said catheter means.

4,618,344
DEPILATORY COMPOSITIONS

Robert L. Wells, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 1, 1982, Ser. No. 383,433

Int. Cl.⁴ A61K *7/155*; C14C *1/06*

U.S. Cl. 8—161 **13 Claims**

1. An aqueous depilatory composition comprising:

(a) from about 0.1M to about 2.0M of an active thiol agent; and

(b) from about 0.01M to about 2.0M of aminoguanidine or its salts;

wherein said composition has a pH of from about 10.5 to about 12.5 at 25° C.

4,618,345
METHOD OF PREPARING HIGH PURITY WHITE PHOSPHORUS

Mark A. Kuck, Upper Montclair, N.J., and Susan W. Gersten, Elmsford, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

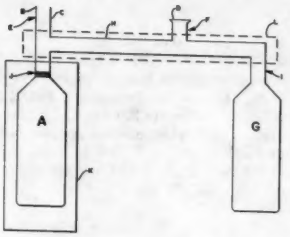
Filed Feb. 17, 1984, Ser. No. 581,105

Int. Cl.⁴ B01D *3/10*

U.S. Cl. 23—293 R **12 Claims**

1. The method of converting high purity red phosphorus to high purity white phosphorus comprising the steps of:

(A) heating red phosphorus of a purity of at least 99% in vacuo to cause it to vaporize, and



(B) condensing liquid white phosphorus from the vapor without the aid of a carrier gas in vacuo.

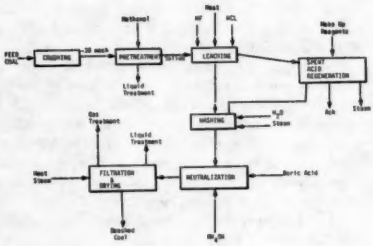
4,618,346
DEASHING PROCESS FOR COAL

Norman Schapiro, Sudbury, and Eugene J. Moreau, Waltham, both of Mass., assignors to Resource Engineering Incorporated, Waltham, Mass.

Filed Sep. 26, 1984, Ser. No. 654,498

Int. Cl.⁴ C10L *1/00*

U.S. Cl. 44—1 A **14 Claims**



1. A process for removing ash and sulfur from coal comprising wetting said coal with an alcohol solution sufficient to swell said coal's pores in order to optimize permeability, wherein said alcohol contains between 1 and 4 carbon atoms; and leaching said coal with a mineral acid wherein both of said wetting and leaching steps take place at a temperature less than 100° C.

4,618,347
FUEL BRIQUETTES AND THEIR PREPARATION

George Watt, 17 Strand View Road, Ballycastle, Co. Antrim, and George E. Young, 24 Rockfield Gardens, Moycraig, Mosside, Ballymoney, Co. Antrim, both of Northern Ireland

PCT No. PCT/GB84/00151, § 371 Date Dec. 26, 1984, § 102(e) Date Dec. 26, 1984, PCT Pub. No. WO84/04534, PCT Pub. Date Nov. 22, 1984

PCT Filed May 4, 1984, Ser. No. 690,491

Claims priority, application United Kingdom, May 10, 1983, 8312742; Feb. 21, 1984, 8404527

Int. Cl.⁴ C10L *5/10, 5/20*

U.S. Cl. 44—16 F **21 Claims**

5. A process for preparing a combustible shaped body, which comprises forming an essentially homogeneous mixture of a particulate fuel material, a lignosulphonate binder and water, in which the weight of water is 2 to 15% of the weight of the fuel material; adding to the essentially homogeneous mixture a dichromate as a cure-initiating component and, simultaneously or subsequently, aqueous sulphuric acid as a cure-accelerating agent; and shaping the resultant composition.

21. A fuel briquette which comprises a particulate fuel material and a binder which is the reaction product of a lignosulphonate, a dichromate and sulphuric acid.

4,618,348

COMBUSTION OF VISCOUS HYDROCARBONS

Michael E. Hayes, Fernandina Beach; Kevin R. Hrebenar, Jacksonville; Patricia L. Murphy; Laurence E. Futch, Jr., both of Fernandina Beach, and James F. Deal, III, Amelia Island, all of Fla., assignors to Petroleum Fermentations N.V., Curaco, Netherlands Antilles

Filed Nov. 2, 1983, Ser. No. 547,892

Int. Cl.[4] C10L *1/32*

U.S. Cl. 44—51 **21 Claims**

1. A method for utilizing viscous hydrocarbons as combustible fuels comprising:

(A) forming a hydrocarbosol using a surfactant package in a proportion of about 1:100 to about 1:20,000 by weight based on hydrocarbon,

(1) said surfactant package comprising

(a) at least one water-soluble surfactant, an effective amount of which surfactant promotes emulsification of a hydrocarbon with API gravity of about 20° API or less, viscosity of about 100 centipoise or greater at 150° F., paraffin content of about 50% by weight or less and aromatic content of about 40% by weight or greater into an aqueous phase to form a hydrocarbon-in-water emulsion wherein the proportion of hydrocarbon to aqueous phase is about 90:10 by volume or less, the viscosity of which emulsion is reduced by at least a factor of about 10 compared to the viscosity of the hydrocarbon; and

(b) at least one water-soluble bioemulsifier, being a microboally-derived substance which predominantly resides at hydrocarbon/water interfaces to substantially surround hydrocarbon droplets in hydrocarbon-in-water emulsions, an effective amount of which bioemulsifier stabilizes a hydrocarbon-in-water emulsion formed with a hydrocarbon as in (a) by maintaining viscosity reduced by at least a factor of about 10 for a period of at least about a day under static conditions,

(2) said hydrocarbosol

(a) comprising a hydrocarbon characterized by an API gravity of about 20° API or less, viscosity of 100 centipoise or greater at 150° F., paraffin content of about 50% by weight or less and aromatic content of about 40% by weight or greater; and

(b) having a hydrocarbon:water ratio of about 70:30 by volume; and

(B) burning the resultant hydrocarbosol.

4,618,349

GRINDING WHEEL MANUFACTURING METHOD

Masahiro Hashimoto, Kamakura, and Hideo Tani, Nara, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki and Osaka Kongo Seito Co., Ltd., Osaka, both of, Japan

Filed May 9, 1983, Ser. No. 492,826

Claims priority, application Japan, May 10, 1982, 57-77733

Int. Cl.[4] B24D *5/00*

U.S. Cl. 51—298 **3 Claims**

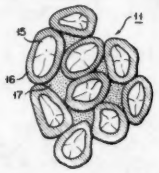
1. A method of manufacturing a grindstone which comprises the steps of:

(a) coating each of a plurality of abrasive grains with a conductive material in an amount ranging in total from 30 to 80% by weight based on said abrasive grains,

(b) homogeneously mixing the resultant coated abrasive grains with a non-conductive binder so as to contain said coated abrasive grains with a non-conductive binder so as to contain said coated abrasive grains in an amount ranging from 40 to 64% by volume and sufficient to effect electrical conductivity throughout the grindstone,

(c) filling the mixture of said coated abrasive grains with said non-conductive binder into a mold,

(d) molding said mixture by discontinuously applying a



pressure a plurality of times while maintaining the temperature of said mixture by heating said mixture in a range in which said binder is softened so as to discharge gasses therein.

4,618,350

GAS-LIQUID CONTACTING

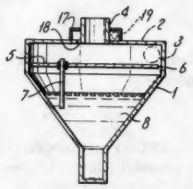
Frederick Rowe, Middlesbrough, and Peter N. Jackson, Stockton-on-Tees, both of England, assignors to Imperial Chemical Industries Plc., London, England

Continuation of Ser. No. 331,386, Dec. 16, 1981, abandoned. This application Mar. 28, 1983, Ser. No. 479,912

Claims priority, application United Kingdom, Dec. 17, 1980, 8040397

Int. Cl.[4] B01D *47/00*

U.S. Cl. 55—92 **3 Claims**



1. A method for contacting a gas or vapour and a liquid which comprises injecting a gas or vapour tangentially into a gas-liquid contacting zone said contacting zone having an inlet for gas or vapour and an exit and being of such shape and dimensions that said injected gas or vapour follows a substantially flat spiral path between said inlet and exit at a tangential velocity which is sufficient to create a large centrifugal force field within said zone and wherein along said substantially flat spiral path said gas or vapour transits at least one inlet to said zone for liquid supplied from liquid supply means located externally to said zone, said liquid inlet being located at a point which is displaced away from the center of the contacting zone and pressure conditions within said contacting zone being so controlled that liquid from said liquid supply means is drawn through said liquid inlet for liquid thereby to counter currently contact the gas or vapour, and injecting a second gas or vapour into said contacting zone, said second gas or vapour being injected with a direction of swirl which is the same as that of the gas or vapour already within said contacting zone and at a point adjacent to said gas or vapour exit, whereby to restrain passage of liquid through said exit.

4,618,351
DEVICE FOR CLEANING OF GASES

Friedrich Esper, Leonberg, and Thomas Frey, Friolzheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

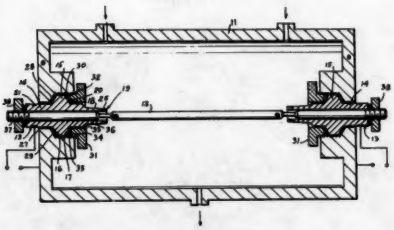
PCT No. PCT/DE84/00022, § 371 Date Aug. 10, 1984, § 102(e) Date Aug. 10, 1984, PCT Pub. No. WO84/03332, PCT Pub. Date Aug. 30, 1984

PCT Filed Jan. 27, 1984, Ser. No. 642,671

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305601

Int. Cl.⁴ B03C *3/06*

U.S. Cl. 55—146 **13 Claims**



1. A coagulator device for cleaning in an electrical field of gases of electrically conductive particles, such as soot and the like, particularly for cleaning exhaust gases of fossil fuels, such as exhaust gases of diesel engines and the like, the device comprising a poled housing which forms a counter electrode, said housing having an axis and being provided with a gas inlet and outlet; an electrode longitudinally extending in said housing concentrically with the latter; an insulator mounted in said housing and encompassing said electrode over a portion of its longitudinal extension so as to insulate said electrode from said housing, said electrode having an outlet location inside said housing, said insulator being provided in the region of said outlet location with a conically tapering ring section extending in an axial direction; means on said insulator forming an annealing zone, said annealing zone forming means including at least one electrical resistance wire which is formed as a thick layer heat path extending around the circumference of said conically tapering ring section of said insulator and having two ends; and electrical connecting contacts provided on said insulator and connected through insulated connecting lines with said ends of said thick layer heat path.

4,618,352
DUST COLLECTOR

Robert T. Nelson, P.O. Box 763, Oklahoma City, Okla. 73101

Filed Oct. 22, 1982, Ser. No. 435,940

Int. Cl.⁴ B01D *46/04*

U.S. Cl. 55—287 **10 Claims**

1. A dust collector comprising:

(a) a housing having inlet means for receiving air to be cleaned;

(b) a plurality of filter units within said housing;

(c) a first centrifugal fan arranged for drawing air through said units for removing dust from the air;

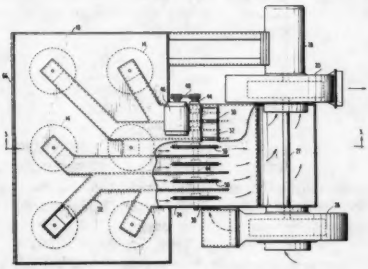
(d) a plurality of ducts each connected to a corresponding one of said units at one end and to said first fan at the other end to provide passages for air from said units to said first fan, said ducts through a portion of their length being arranged in side-by-side relationship;

(e) a second centrifugal fan for providing reverse flow of air through said ducts to said units, said second fan providing a high volume of air at low pressure;

(f) a transverse duct connected to said second fan and extending transversely of said portion of said plurality of ducts and adjacent thereto;

(g) a plurality of openings providing communication between said transverse duct and each of said plurality of ducts;

(h) a plurality of control vanes, one such vane being disposed in each of said pluality of ducts, for controlling communication between said transverse duct and said plurality of ducts, each of said vanes being movable between a first position closing a corresponding one of said openings to block communication between said transverse duct and the corresponding one of said plurality of ducts



and a second position providing communication with said transverse duct for effecting reverse flow of air through said corresponding one of said ducts and blocking passage of air through said corresponding one of said ducts to said first fan whereby no air to be cleaned is directed toward the filter unit connected to said corresponding one of said ducts; and

(i) rotatable means engaging said vanes for sequentially moving said plurality of vanes between said first and second positions.

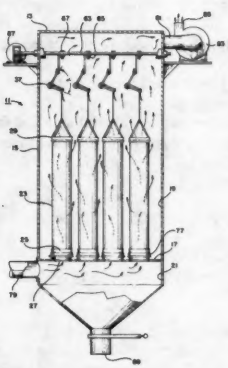
4,618,353
FILTER BAG ASSEMBLY

Gerald J. Reier, P.O. Box 79141, Fort Worth, Tex. 76179

Filed Jul. 23, 1985, Ser. No. 757,943

Int. Cl.⁴ B01D *46/02*

U.S. Cl. 55—378 **7 Claims**



4. An improved filter bag assembly for a filter housing, comprising:

at least one filter bag having a lower end which is anchored within said filter housing and having an upper end;

a flexible strap attached at one end to the upper end of said bag and having an opposite free end;

a bag spring having a central coil, a pair of angularly arranged spring sides which extend outwardly from said coil and which are movable between tensed and relaxed positions, and a loose spring arm extending outwardly from said coil, a selected one of said spring sides together with said loose spring arm comprising clasp means engaging said free end of said flexible strap; and

hanger means suspended within said filter housing and engaging the remaining bag spring side to support said bag spring within said filter housing, said flexible strap being engaged with said clasp means with said bag spring in said tensed position, whereby relaxing said spring serves to tense said filter bag.

4,618,354

METHOD, APPARATUS AND BURNER FOR FABRICATING AN OPTICAL FIBER PREFORM

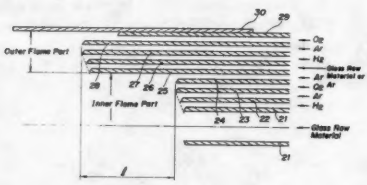
Hiroyuki Suda; Shuichi Shibata, and Motohiro Nakahara, all of Mito, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 705,362

Claims priority, application Japan, Feb. 27, 1984, 59-34300; Mar. 1, 1984, 59-37223; Feb. 12, 1985, 60-23486; Feb. 12, 1985, 60-23487; Feb. 12, 1985, 60-23488

Int. Cl.[4] C03F *37/018*

U.S. Cl. 65—2 **10 Claims**



1. An optical fiber preform fabrication method comprising the steps of:

using a burner having a central raw material supply orifice for supplying a glass raw material and a plurality of flame forming orifices disposed around said raw material supply orifice sequentially for forming a plurality of flames, respectively, the number of flames being at least equal to k+1;

determining and controlling the flame speed V_k of, a kth flame, the flame speed V_{k+1} of a (k+1)th flame outwardly surrounding said kth flame and the flow speed Vm of the glass raw material supplied through the center of the buner in such a way that the following relations are satisfied:

$$0.1V_{k+1} \leqq Vk \leqq 2.5V_{k+1},$$

$$Vm \leqq V_{k+1} \text{ and}$$

$$Vm \leqq V_k;$$

supplying combustion gases to said flame forming orifices and combusting to provide said flames;

supplying said glass raw material to the multiflame produced by said burner in which the kth flame is positioned axially rearwardly of the (k+1)th flame to synthesize fine glass particles;

depositing said fine glass particles on a seed rod to form a porous preform; and

consolidating said porous preform into a transparent optical fiber preform.

4,618,355

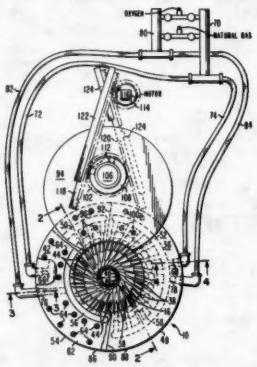
METHOD AND APPARATUS FOR SEALING A MOUNT IN A CATHODE RAY TUBE

Jack F. Otto, and Michael A. Colacello, both of Trenton, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 31, 1985, Ser. No. 793,313

Int. Cl.[4] C03B *23/217*

U.S. Cl. 65—36 **14 Claims**



1. A method for sealing a mount including a wafer in a neck of a stationary cathode-ray tube oriented along an axis comprising:

positioning a first tier of burner tips completely around the neck of said cathode-ray tube at a first distance therefrom such that said burner tips are aimed nonradially along directions tangent to a first circle, the plane of said first circle being aligned along said wafer, said first tier of burner tips being split into at least first and second radial segments, each segment being connected to means for moving the segment toward and away from the neck;

providing a vortical pattern of flames around the neck from said first tier of stationary burner tips; and

removing said radial segments from around the stationary neck of said cathode-ray tube sufficiently to allow said tube to proceed along a conveyor line.

11. Apparatus for sealing a mount in a neck of a cathode-ray tube oriented along an axis comprising a first tier of burner tips disposed completely around said axis at a first distance therefrom and similarly aimed nonradially along directions tangent to a first circle, said first tier of burner tips being split into at least first and second radial segments, each segment being connected to means for moving the segment toward and away from the neck.

4,618,356

MOVING MEANS FOR USE IN A GLASSWARE MANUFACTURING MACHINE

Walter Hirt, Buelach, and Fritz Futterknecht, Zurich, both of Switzerland, assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Oct. 23, 1985, Ser. No. 790,558

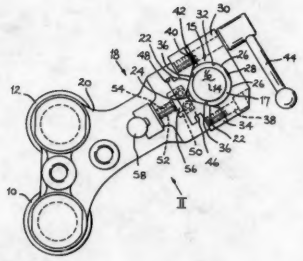
Claims priority, application United Kingdom, Oct. 27, 1984, 8427221

Int. Cl.[4] C03B *9/40*

U.S. Cl. 65—173 **9 Claims**

1. Moving means for use in a glassware manufacturing machine for moving an operative member between an out-of-the-way position thereof and an operative position thereof in alignment with an opening of a cavity of a mould of the machine, the operative member making a movement which has a rotary component about a vertical axis and a linear component in a vertical direction, the moving means comprising a vertically-

extending shaft, a support for the operative member comprising a horizontally-extending arm on which the operative member is mounted and clamping means by which the support is clamped to the vertically-extending shaft so that the support moves with the shaft, and means operable to move the shaft longitudinally thereof and to turn the shaft about a vertical axis



thereof to thereby move the operable member vertically and about the vertical longitudinal axis of the shaft, wherein the shaft and the support are provided with complementarily-shaped camming surfaces which, when in engagement with one another, force the support into a particular orientation with respect to the shaft, the particular orientation being the correct orientation for the support on the shaft.

4,618,357

NOVEL ALKENYL ACETAMIDES AND THEIR USE IN THE REGULATION OF THE NATURAL GROWTH OR DEVELOPMENT OF TURF GRASS

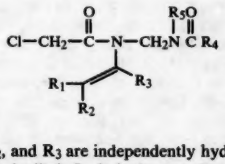
Gerhard H. Alt, University City; John P. Chupp, Kirkwood, and Lane A. Cizbe, Chesterfield, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 13, 1985, Ser. No. 701,272

Int. Cl.[4] A01N *37/118*

U.S. Cl. 71—76 **8 Claims**

1. A method for retarding the growth of turf grass which comprises applying to said turf grass an effective growth retarding amount of a compound of the formula:



wherein R_1, R_2, and R_3 are independently hydrogen, halogen C_{1-6} alkyl, or haloalkyl; R_4 is hydrogen; C_{1-4} alkyl, alkenyl, C_{3-4} cycloalkyl, or C_{2-6} alkoxyalkyl, and R_5 is hydrogen or C_{1-4} alkyl.

4,618,358

HERBICIDAL N-2-(NITRO-5-PHENOXY-PHENYL)-AMINOALKYL-PHOSPHONIC ACID AND ESTERS

Ludwig Maier, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

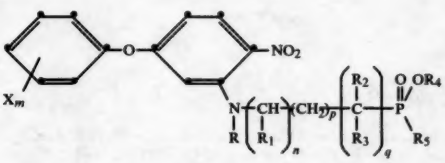
Division of Ser. No. 484,765, Apr. 14, 1983, abandoned. This application Sep. 19, 1984, Ser. No. 651,968

Claims priority, application Switzerland, Apr. 23, 1982, 2500/82; Nov. 11, 1982, 6585/82

Int. Cl.[4] A01N *57/06, 57/08;* C07F *9/40*

U.S. Cl. 71—86 **22 Claims**

1. A (2-nitro-5-aryloxyphenylamino)alkylphosphonic, -alkylphosphonic or -alkylphosphonous acid derivative of the formula



wherein

X is halogen, CF_3, NO_2, CN, $CONH_2$ or $CSNH_2$,

R_1 is C_1–C_4alkyl,

R_2 is C_1–C_4alkyl, phenyl or —$PO(OR_6)_2$,

R_3 is hydrogen or C_1–C_4alkyl,

R_4 is hydrogen, C_1–C_4alkyl or a cation,

R_5 is hydrogen, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, hydroxyl or an —O—cation group,

R_6 is hydrogen or C_1–C_4alkyl,

m is a value from 0 to 3,

n is 0 or 1,

p is a value from 0 to 3 and

q is 0 or 1,

with the proviso that R_1 and R_3 taken together may also be an unsubstituted or substituted C_1–C_3alkylene chain and at least one of the symbols n, p and q is a value different from 0.

2. A method of controlling undesired plant growth or of regulating plant growth, which comprises applying to plants, to the locus thereof or to parts of plants an effective amount of a compound of as claimed in claim 1.

4,618,359

HETEROCYCLIC ESTERS OF PHENOXYBENZOIC ACIDS USEFUL AS HERBICIDES

Frank Wu, Libertyville, Ill., assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 475,414, Mar. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 351,697, Feb. 24, 1982, abandoned. This application Mar. 25, 1985, Ser. No. 715,442

Int. Cl.[4] A01N *43/08;* C07D *307/04*

U.S. Cl. 71—88 **9 Claims**

1. 3-Tetrahydrofuryl 2-nitro-5-(2-chloro-4-trifluoromethylphenoxy)benzoate.

2. A herbicidal composition comprising an inert carrier and a herbicidally toxic amount of the compound of claim 1.

4,618,360

CYCLOHEXANEDIONECARBOXYLIC ACID DERIVATIVES WITH HERBICIDAL AND PLANT GROWTH REGULATING PROPERTIES

Hans-Georg Brunner, Lausen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

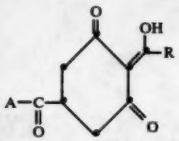
Continuation-in-part of Ser. No. 610,222, May 14, 1984. This application Nov. 19, 1984, Ser. No. 673,077

Claims priority, application Switzerland, May 18, 1983, 2693/83; Dec. 19, 1983, 6747/83

Int. Cl.[4] C07C *103/737;* C07D *207/06, 211/06, 295/18;* A01N *43/36, 43/40, 43/84, 37/18*

U.S. Cl. 71—88 **17 Claims**

1. A cyclohexanedionecarboxylic acid derivative of the formula



wherein A is an $-NR_3R_4$ radical, R is C_1–C_6alkyl which is unsubstituted or substituted by halogen, C_1–C_6alkoxy or C_2–C_4alkylthio, R_3 and R_4 are each independently hydrogen, C_1–C_6alkyl, C_2–C_{10}alkoxyalkyl, C_2–C_{10}alkylthioalkyl; C_3–C_6alkenyl, C_3–C_6alkynyl; one of R_3 and R_4 is also phenyl or benzyl, wherein the phenyl nucleus is unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4haloalkyl, nitro or cyano, or R_3 and R_4, together with the nitrogen atom to which they are attached form a pyrrolidine, piperidine or morpholine ring; or a metal or ammonium salt thereof.

13. A method of controlling undesirable plant growth, which comprises applying an effective amount of a cyclohexanedionecarboxylic acid derivative according to claim 1 to the plant or the locus thereof.

14. A method of regulating plant growth, which comprises applying an effective amount of a cyclohexanedionecarboxylic acid derivative according to claim 1 to the plant or the locus thereof.

4,618,361

ACYLAMIDES AND COMPOSITIONS FOR THE PROTECTION OF CULTIVATED PLANTS AGAINST THE PHYTOTOXIC ACTION OF HERBICIDES

Hans Moser, Magden, Switzerland, assignor to CIBA-GEIGY Corporation, Ardsley, N.Y.

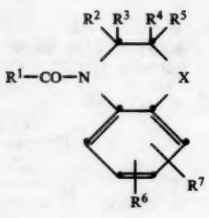
Filed Dec. 12, 1983, Ser. No. 560,465

The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.

Int. Cl.[4] A01N *43/84*; C07D *265/36, 279/16*

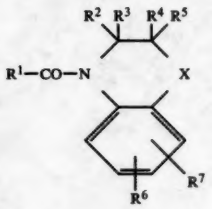
U.S. Cl. 71—88 **28 Claims**

1. Acylamides of the formula



in which X is oxygen, R^1 is C_1–C_6-cyanoalkyl, C_2–C_6-halogenoalkenyl or C_1–C_6-alkyl which is substituted by at least two chlorine atoms; R^2 and R^5 independently of one another are hydrogen, C_1–C_4-alkyl, C_1–C_4-halogenoalkyl, C_2–C_4-alkenyl, C_2–C_4-alkynyl or C_2–C_4-alkoxyalkyl; R^3 and R^4 independently of one another are hydrogen, C_2–C_4-alkenyl, C_2–C_4-alkynyl, cyano, C_2–C_4-alkoxyalkyl, $-COOR^8$, $-CO-NR^9R^{10}$ or C_1–C_4-alkyl which is unsubstituted or substituted by halogen, cyano or —CO—A; R^6 and R^7 independently of one another are hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-halogenoalkyl or C_1–C_4-halogenoalkoxy, A is C_1–C_4-alkyl, C_2–C_4-alkenyl, C_1–C_4-alkoxy, C_3–C_4-alkenyloxy, C_3–C_4-alkynyloxy or $-NR^{11}R^{12}$; R^8, R^{10} and R^{12} independently of one another are hydrogen, C_1–C_4-alkyl, C_3–C_4-alkenyl, C_3–C_4-alkynyl or C_3–C_4-alkoxyalkyl;and R^9 and R^{11} independently of one another are hydrogen, C_1–C_4-alkyl, C_3–C_4-alkenyl, C_1–C_4-alkoxy, C_3–C_4-alkynyl or C_3–C_4-alkoxyalkyl, it being also possible for R^9 and R^{10} and also R^{11} and R^{12}, together with the nitrogen atom linking them, to form a 5-membered or 6-membered saturated heterocyclic structure which can, optionally, contain an oxygen or sulfur atom or an —NH— or —N(C_1–C_4-alkyl)- bridge as a member of the ring.

27. A process for protecting cultivated plants against damage occurring in the application of herbicides, which comprises treating either the area cultivated for the plant, before or during the application of the herbicide, or the seed or cuttings of the plants or the plant itself, with an effective amount of an acylamide of the formula



in which X is oxygen, R^1 is C_1–C_6-cyanoalkyl, C_2–C_6-halogenalkenyl or C_1–C_6-alkyl which is substituted by at least two chlorine atoms; R^2 and R^5 independently of one another are hydrogen, C_1–C_4-alkyl, C_1–C_4-halogenoalkyl, C_2–C_4-alkenyl, C_2–C_4-alkynyl or C_2–C_4-alkoxyalkyl; R^3 and R^4 independently of one another are hydrogen, C_2–C_4-alkenyl, C_2–C_4-alkynyl, cyano, C_2–C_4-alkoxyalkyl, $-COOR^8$, $-CO-NR^9R^{10}$ or C_1–C_4-alkyl which is unsubstituted or substituted by halogen, cyano or —CO—A; R^6 and R^7 independently of one another are hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-halogenoalkyl or C_1–C_4-halogenoalkoxy; A is C_1–C_4-alkyl, C_2–C_4-alkenyl, C_1–C_4-alkoxy, C_3–C_4-alkenyloxy, C_3–C_4-alkynyloxy or $-NR^{11}R^{12}$; R^8, R^{10} and R^{12} independently of one another are hydrogen, C_1–C_4-alkyl, C_3–C_4-alkenyl, C_3–C_4-alkynyl or C_3–C_4-alkoxyalkyl; and R^9 and R^{11} independently of one another are hydrogen, C_1–C_4-alkyl, C_3–C_4-alkenyl, C_1–C_4-alkoxy, C_3–C_4-alkynyl or C_3–C_4-alkoxyalkyl, it being also possible for R^9 and R^{10} and also R^{11} and R^{12}, together with the nitrogen atom linking them, to form a 5-membered or 6-membered saturated heterocyclic structure which can, optionally contain an oxygen or sulfur atom or an —NH— or —N(C_1–C_4-alkyl)- bridge as a member of the ring.

4,618,362

INCREASING THE SUGAR CONTENT OF PLANTS

Rainer Becker, Bad Durkheim; Dieter Jahn, Edingen-Neckarhausen; Ulrich Schirmer, Heidelberg; Eberhard P. Schott, Neustadt; Bernhard Hesse, Neuhofen, and Johann Jung, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

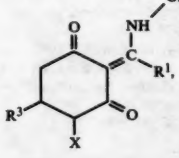
Filed Jul. 29, 1985, Ser. No. 760,042

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 3428457

Int. Cl.[4] A01N *43/16, 43/18*

U.S. Cl. 71—88 **8 Claims**

1. A method for increasing the sugar content of sugar producing plants, wherein the plants are treated, from 1 to 15 weeks prior to harvesting, with an effective amount of a compound of the formula (I)



(I)

where R^1 is alkyl of 1 to 4 carbon atoms, R^2 is alkyl of 1 to 4 carbon atoms, unsubstituted or halogen-substituted alkenyl of 3 to 5 carbon atoms or alkynyl of not more than 5 carbon atoms, R^3 is a tetrahydropyranyl or a tetrahydrothiopyrnanyl substituent, and can be substituted by alkyl of not more than 3 carbon atoms, and X is H or COO-alkyl, or one of its plant-tolerated salts.

4,618,363
N-PHENYLSULFONYL-N'-TRIAZINYLUREAS

Karl Gass, Magden; Werner Föry, Basel; Willy Meyer, Riehen, and Werner Töpfl, Dornach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

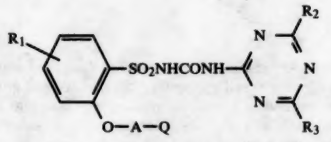
Filed Jan. 18, 1983, Ser. No. 458,799

Claims priority, application Switzerland, Jan. 25, 1982, 437/82

Int. Cl.[4] C07D *401/12, 405/12;* **A01N** *43/70, 43/66*

U.S. Cl. 71—90 **26 Claims**

1. A compound selected from the group consisting of a sulfonylurea of the formula:



wherein

R_1 is hydrogen, halo, nitro, alkyl of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkenyl of 2 to 5 carbon atoms, or alkoxycarbonyl of 1 to 4 carbon atoms in the alkoxy group;

R_2 is alkyl or alkoxy, each of 1 to 3 carbon atoms, unsubstituted or substituted with 1 to 3 halogen atoms;

R_3 is halo, hydrogen, unsubstituted alkyl of 1 to 3 carbon atoms, alkyl of 1 to 3 carbon atoms substituted with alkoxy of 1 to 4 carbon atoms or with 1 to 3 halogen atoms, unsubstituted alkoxy of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms substituted with methoxy, ethoxy or 1 to 3 halogen atoms, or $—NR_4R_5$ in which R_4 is hydrogen or methyl and R_5 is hydrogen, methyl, ethyl or methoxy; and

Q is a heterocyclic ring selected from the group consisting of (i) a saturated ring of 3 to 6 members containing one or two nonadjacent oxygen atoms as the hetero atoms, which ring is unsubstituted or substituted with one to three alkyl groups, each of 1 to 3 carbon atoms, (ii) pyridyl, unsubstituted or substituted with chloro or methyl, or (iii) thienyl; and

A is a direct bond, alkylene of 1 to 4 carbon atoms or alkenylene of 2 to 4 carbon atoms; and

the alkali metal, alkaline earth metal, and organic amine salts thereof.

4,618,364
3-(2-TETRAHYDROPYRANYL)-1,2,3,4,5,6,7-HEXAHYDRO-1-P-TOLYLOXYCARBONYL-5H-CYCLOPENTAPYRIMIDINE-2,4-DIONE AND HERBICIDAL COMPOSITIONS AND METHODS USING IT

Jean Tessier, Vincennes, and Pierre Girault, Paris, both of France, assignors to Roussel Uclaf, Paris, France

Filed Jul. 6, 1984, Ser. No. 628,331

Claims priority, application France, Jul. 11, 1983, 83 11518

Int. Cl.[4] A01N *47/38;* **C07D** *239/70*

U.S. Cl. 71—92 **6 Claims**

1. A compound which is 3-(2-tetrahydropyranyl)-1,2,3,4,6,7-hexahydro-1-p-tolyoxycarbonyl-5H-cyclopentapyrimidine-2,4-dione.

3. A method of selectively killing weeds comprising contacting weeds with and herbicidally effective amount of at least one compound of claim 1.

4,618,365
SUBSTITUTED TETRAZOLINONES AND THEIR USE AS HERBICIDES

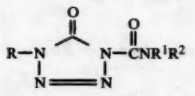
Rupert A. Covey, Bethany; Patricia J. Forbes, Waterbury, and Allyn R. Bell, Cheshire, all of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Dec. 9, 1983, Ser. No. 560,031

Int. Cl.[4] C07D *401/06, 257/04;* **A01N** *43/67*

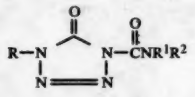
U.S. Cl. 71—92 **7 Claims**

1. A compound having the formula



where R is C_1–C_{12} alkyl, C_5–C_6 cycloalkyl, C_2–C_{13} alkoxyalkyl, C_7–C_9 aralkyl, phenyl, naphthyl, phenyl substituted with F, Cl, Br, I, C_1–C_4 alkyl, C_1–C_4 alkoxy, methylenedioxy, NR^3R^4 wherein R^3 and R^4 are the same or different and are hydrogen or C_1–C_6 alkyl, C_2–C_5 alkoxycarbonyl, carboxy, phenoxy, NO_2, cyano, trihalomethyl or trihalomethoxy wherein halo is F, Cl or Br or benzyl substituted with F, Cl, Br, I, C_1–C_4 alkyl, C_1–C_4 alkoxy, methylenedioxy, C_2–C_5 alkoxycarbonyl, phenoxy, NO_2, cyano, trihalomethyl or trihalomethoxy wherein halo is F, Cl or Br; R^1 and R^2 are the same or different and are C_1–C_6 alkyl, C_3–C_6 alkenyl, C_5–C_6 cycloalkyl or R^1 and R^2 together are C_4–C_8 alkylene.

5. A method for controlling weeds by applying a herbicidally effective amount of a compound having the formula



where R is C_1–C_{12} alkyl, C_5–C_6 cycloalkyl, C_2–C_{13} alkoxyalkyl, C_7–C_9 aralkyl, phenyl, naphthyl, phenyl substituted with F, Cl, Br, I, C_1–C_4 alkyl, C_1–C_4 alkoxy, methylenedioxy, NR^3R^4 wherein R^3 and R^4 are the same or different and are hydrogen or C_1–C_6 alkyl, C_2–C_5 alkoxycarbonyl, phenoxy, NO_2, cyano, trihalomethyl or trihalomethoxy where halo is F, Cl or Br or benzyl substituted with F, Cl, Br, I, C_1–C_4 alkyl, C_1–C_4 alkoxy, methylenedioxy, C_2–C_5 alkoxycarbonyl, carboxy, phenoxy, NO_2, cyano, trihalomethyl or trihalomethoxy where halo is F, Cl or Br; R^1 and R^2 are the same or different and are C_1–C_6 alkyl, C_3–C_6 alkenyl, C_5–C_6 cycloalkyl or R^1 and R^2 together are C_4–C_8 alkylene.

4,618,366
CERTAIN N-(2,4-DIFLUOROPHENYL)-2-(3-TRIFLUOROMETHYLPHENOXY)-NICOTINAMIDES HAVING HERBICIDAL ACTIVITY

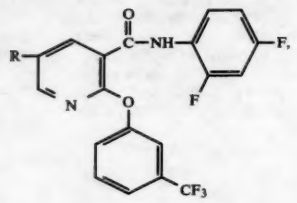
Michael C. Cramp, Romford; James Gilmour, Barkingside, and Edgar W. Parnell, Hornchurch, all of England, assignors to May & Baker Limited, Dagenham, England

Continuation of Ser. No. 378,224, May 14, 1982, abandoned. This application Jun. 15, 1984, Ser. No. 621,102

Int. Cl.[4] C07D *213/64, 213/65;* **A01N** *43/40*

U.S. Cl. 71—94 **21 Claims**

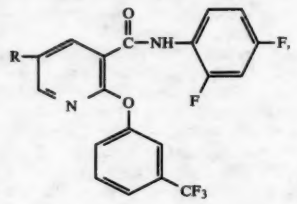
1. A nicotinamide derivative of the general formula:



(I)

wherein R represents a hydrogen atom or a methyl group.

5. A method for controlling the growth of weeds at a locus which comprises applying a herbicidal composition to the locus pre-emergence of the weeds, which herbicidal composition comprises, as the active ingredient, a herbicidally effective amount of a nicotinamide derivative of the general formula:



(I)

wherein R represents a hydrogen or a methyl group.

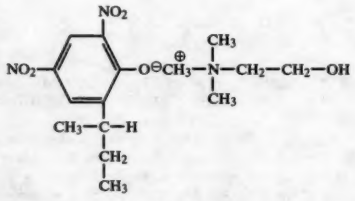
4,618,367

NOVEL HERBICIDAL SALT

Milton S. Bernard, Vicksburg, Miss., assignor to Vertac Chemical Corporation, Memphis, Tenn.

Filed Sep. 18, 1985, Ser. No. 777,368
Int. Cl.[4] A01N *31/08*; C07C *91/04*
U.S. Cl. 71—121 5 Claims

1. The salt of 6-sec.-butyl-2,4-dinitrophenol and choline of the formula



I

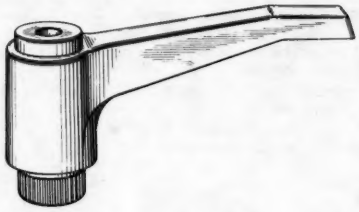
4. A method of selectively controlling weeds in useful crops comprising applying to fields of a useful crop an herbicidally effective amount of the choline salt of dinoseb.

4,618,368

METHOD OF INJECTION OF WIRE INTO MOLTEN STEEL AND APPARATUS FOR UNCOILING WIRE FOR USE IN THE METHOD

Leonard Jansse, Amsterdam, Netherlands, assignor to Hoogovens Groep B.V., Ijmulden, Netherlands

Filed Sep. 24, 1985, Ser. No. 779,456
Claims priority, application Netherlands, Sep. 24, 1984, 8402911
Int. Cl.[4] C21C *7/02*
U.S. Cl. 75—53 7 Claims



1. A method for injecting wire into molten steel comprising
(a) positioning a self-supporting parallel-wound coil of the wire around a mandrel, resiliently clamping the coil around at least part of its outer surface over its whole axial length, the axial length of the mandrel being greater than that of the coil and, at the start of uncoiling of the coil there being a gap of at least 5 cm between the inside surface of the coil and the mandrel,
(b) thereafter pulling the wire from the inside of the coil and feeding the wire into the molten steel through a ring which is mounted around the mandrel axially spaced from the coil and which has a slot-shaped radial extension open to the interior of the ring, and
(c) connecting the wire end on the outside of the coil to the wire end on the inside of a further such coil through the said slot-shaped radial extension.

4,618,369

OIL-IN-WATER SUSPENSIONS AS ADDITIVES FOR CEMENTS

Robert Smith-Johannsen, Incline Village, Nev., assignor to Ramu International, Incline Village, Nev.

Division of Ser. No. 418,790, Sep. 16, 1982, abandoned. This application Dec. 21, 1984, Ser. No. 684,556
Int. Cl.[4] C04B *24/08*
U.S. Cl. 106—95 24 Claims

1. A method of forming a cement which comprises mixing hydratable cement particles with water in conventional proportions and adding thereto before curing an oil-in-water suspension in which the oil droplets are surrounded by colloidal particles comprising the reaction product of at least one anionic agent and at least one cationic agent, said particles having a zeta potential of between about +18 and −18 millivolts.

4,618,370

FOAM GENERATING COMPOSITIONS

Harold A. Green, Havertown, Pa., and Morris Weinstein, Paramus, N.J., assignors to Millmaster Onyx Group, Inc., New York, N.Y.

Filed Sep. 3, 1985, Ser. No. 771,628
Int. Cl.[4] C04B *24/00*; B32B *5/20*; B01V *13/00*; B29C *27/60*
U.S. Cl. 106—111 3 Claims

1. A composition comprising a salt of a mixture of n-alkyl oxyethylated sulfuric acids, the salt being selected from the group consisting of sodium salt, ammonium salt and mixtures thereof, all of said salts having the formula $CH_3(CH_2)_x(OCH_2CH_2)_yOSO_3^-M^+$, being either the

sodium or ammonium cation, x being an integer from about 6 to 12 and y being an integer of about 1 to 3.5, a major portion of said mixture consisting of those compounds in which x equals about 6 to 8 and a minor portion of said mixture consisting of those salts in which x equals about 10 to 12, wherein the ratio of the combined weight of the compounds in which x equals about 6 to 8 to the combined weight of the compounds in which x equals about 10 to 12 is from about 2:1 to about 8:1, wherein the ratio of the weight of the compounds in which x equals about 6 to the weight of the compounds in which x equals about 8 is about 1:1, and wherein the ratio of the weight of the compounds in which x equals about 10 to the weight of the compounds in which x equals about 12 is from about 3:1 to about 1:3.

4,618,371

COATING MATERIALS WHICH CONTAIN α-HYDROXYKETONES AS ANTISKIMMING AGENTS

Wolfram Weiss, Mutterstadt; Wolf Dieter Balzer; Rolf Fikentscher, both of Ludwigshafen; Guenther Immel, Weinheim, and Hans Wolf, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

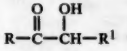
Filed May 15, 1985, Ser. No. 734,186

Claims priority, application Fed. Rep. of Germany, May 22, 1984, 3418988

Int. Cl.⁴ C08L *91/00*

U.S. Cl. 106—263 **6 Claims**

1. A coating material, paint or finish which contains an oxidatively drying film former and, as an anti-skimming agent, an aliphatic α-hydroxyketone of the formula



where R and R^1 are each hydrogen or a hydrocarbon radical of 1 to 4 carbon atoms.

4,618,372

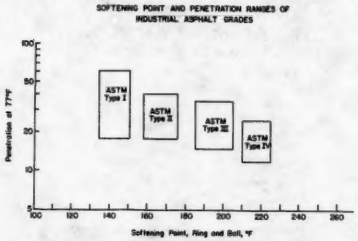
METHOD FOR PRODUCING INDUSTRIAL ASPHALTS WITHOUT AIR-BLOWING USING HYDROBROMIC ACID

Judson E. Goodrich, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 31, 1984, Ser. No. 672,430

Int. Cl.⁴ C08L *95/00*

U.S. Cl. 106—273 R **11 Claims**



1. A one-step method of producing an industrial asphalt from a bituminous material which consisting essentially of mixing together without air-blowing:

(a) a feed material consisting essentially of a bituminous material having a viscosity of at least 50 centistokes at 350 degrees Fahrenheit and wherein the feed material forms a single phase when mixed with 5 weight percent hydrobromic acid; and

(b) from about 0.1 to 20.0 percent by weight of hydrobromic acid, said mixing being done at a temperature in the range of 351 to 600 degrees Fahrenheit, whereby the softening point of the feed is substantially increased and the penetration is significantly decreased.

8. A one-step method of producing an industrial asphalt from a petroleum residuum which consisting essentially of mixing together without air-blowing:

(a) a feed consisting essentially of a petroleum residuum having a viscosity of 65 to 180 centistokes at 350 degrees Fahrenheit and wherein said feed forms a single phase when mixed with 5 weight percent hydrobromic acid; and

(b) from more than 0.5 to less than 10 percent by weight of hydrobromic acid, said mixing being done at a temperature in the range of 400 to 500 degrees Fahrenheit for from 5 to 25 minutes; whereby the softening point of the petroleum residuum is substantially increased by 30 to 70 degrees Fahrenheit and the penetration is significantly decreased by at least 10 to 60 dmm at 77 degrees Fahrenheit thereby producing an industrial asphalt having a softening point in the range 200 to 235 degrees Fahrenheit and a penetration of 12 to 30 dmm.

4,618,373

AIR-BLOWING ASPHALT USING HYDROHALIC ACID CATALYSTS

Penny K. Eidem, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 28, 1984, Ser. No. 584,428

Int. Cl.⁴ C08L *95/00*

U.S. Cl. 106—273 R **17 Claims**

1. An asphalt composition for air-blowing consisting of a catalytic amount of hydrohalic acid, and asphalt in an amount to equal 100 weight percent.

4,618,374

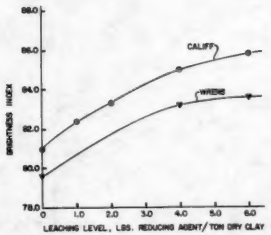
HIGH SOLIDS PROCESSING OF KAOLINITIC CLAYS WITH POST-LEACHING OXIDATION

Thomas D. Thompson, III, Upper Black Eddy, Pa.; Walter J. Polestak, Summit, and Robert W. Bradshaw, Brick, both of N.J., assignors to Georgia Kaolin Company, Inc., Union, N.J.

Filed Mar. 29, 1985, Ser. No. 717,937

Int. Cl.⁴ C04B *14/00, 33/00*

U.S. Cl. 106—288 B **7 Claims**



1. A process for treating a crude kaolinitic clay containing iron-containing impurities, comprising:

a. mixing a crude kaolinitic clay with water having a dispersing agent dissolved therein to form a fluid aqueous suspension of said crude kaolinitic clay, said suspension having a solids content of at least 55% by weight;

b. subjecting said suspension to a degritting process to reduce the percentage by weight of the particles in said suspension to 92–95% having a particle size finer than 2 microns;

c. dissolving a water-soluble reducing agent in an aqueous solution of a water-soluble anionic phosphate dispersing agent to form an aqueous leachng solution;

d. treating said degritted suspension at an acid pH with said

aqueous leaching solution at a treatment level of at least four pounds of reducing agent per ton of dry clay for a time sufficient to convert a substantial portion of ferric ions in the iron-containing impurities therein to ferrous ions, said leached suspension having a solids content of at least 55% by weight; and

e. treating said leached suspension with an oxidizing agent at a treatment level sufficient to oxidize a substantial portion of any unreacted reducing agent and leaching process byproducts in said leached suspension.

4,618,375
TRANSPARENT IRON OXIDE PIGMENTS

Arvind S. Patil, Wyoming, and Louis J. Pepoy, Holland, both of Mich., assignors to BASF Corporation, Wyandotte, Mich.

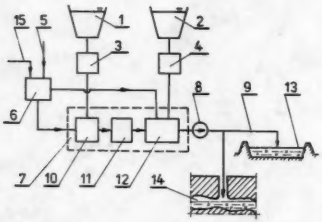
Filed Oct. 4, 1984, Ser. No. 657,579
Int. Cl.[4] C08K *3/20*
U.S. Cl. 106—304 **25 Claims**

1. A process for preparing transparent iron oxide pigment comprising reacting an iron compound, an organic ammonia releasing compound and water in a non-aqueous solvent in which both the iron compound and ammonia releasing compound have appreciable solubility, and in which water has some solubility by refluxing for a period of about 1 to 24 hours.

4,618,376
METHOD OF PRODUCING A SUSPENSION OF FLY ASH IN WATER

Antoni Saternus, Tychy-Bierun Stary; Ludwik Miczek, Pszczyna, and Mieczyslaw Bartnik, Gliwice, all of Poland, assignors to Zaklady Produkcji Urzadzen Mechanicznych im. Janka Krasickiego "Elwo", Pszczyna and Biuro Studiow i Projektow Energetycznych "Energoprojekt", Katowice, both of, Poland

Filed Dec. 19, 1984, Ser. No. 683,654
Claims priority, application Poland, Dec. 19, 1983, 245199
Int. Cl.[4] B01F *3/12*
U.S. Cl. 134—26 **3 Claims**



1. A method for the continuous producing of a suspension of fly-ash in water having a concentration of 0.5 to 2.5 parts ash to 1 part water in a flow mixer including a moisturization zone, a homogenization zone, and a fluidization zone, which steps comprise:

(a) adding 1 part fly ash to 0.2 parts water by weight to the moisturization zone and slowly mixing to produce an intermediate product comprising a dense plastic non-fluid substance;

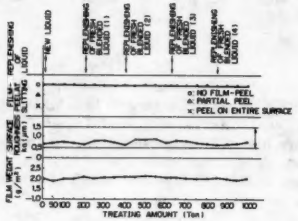
(b) homogenizing and dethickening the intermediate product by intensive non-turbulent mixing in the homogenization zone; and

(c) in the fluidization zone, adding water to obtain said concentration and turbulently mixing said intermediate product at increasing velocity gradients to electrostatically discharge said fly ash and form said suspension.

4,618,377
METHOD FOR SURFACE TREATMENT OF ELECTRICAL STEEL SHEET

Motoharu Nakamura; Kikuzi Hirose, and Tooru Sakamoto, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 9, 1985, Ser. No. 785,750
Claims priority, application Japan, Feb. 9, 1985, 60-22761
Int. Cl.[4] C23C *22/26*
U.S. Cl. 148—6.15 R **8 Claims**



1. A method for forming an insulating film on an electrical steel sheet, comprising the steps of:

(a) surface-treating organic resin particles having a diameter of from 2 μm to 50 μm with a predetermined amount of dispersion improver;

(b) adding a predetermined amount of said surface-treated organic resin particles into an emulsion resin solution;

(c) mixing a predetermined amount of said emulsion resin solution, into which said surfacetreated organic resin particles are added and dispersed, with a solution containing an at least one inorganic component selected from the group consisting of phosphate and chromate;

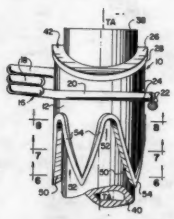
(d) applying a predetermined amount of the obtained mixture in step(c) on a surface of the electrical steel sheet; and,

(e) baking the applied mixture at a temperature at which the organic resin particles are semimelted and provide a surface roughness Ra in the range of from 0.5 μm to 1.5 μm, thereby enabling a stable formation of an insulating film having improved blanking and insulation properties and weldability, over a long period of treatment time.

4,618,378
PIPE CUTTING TEMPLET

James E. Huckaby, Tatum, N. Mex., assignor to Shuf-Kut, Inc., Tatum, N. Mex.

Filed Jul. 16, 1985, Ser. No. 755,942
Int. Cl.[4] B23K *7/10*
U.S. Cl. 148—9.6 **15 Claims**



8. A process of cutting metal pipe having an axis and a pipe wall comprising:

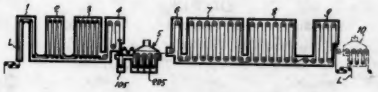
(a) providing a cutting torch having a flat-sided collar proximate the tip,

(b) aligning the flat sides of the collar in a substantially parallel orientation to a desired cutting axis,
(c) telescoping a tube having a cylindrical tube wall over the pipe and
(d) adjusting the tube so that a desired axial pattern at one end of the tube is positioned as desired on the pipe,
(e) placing the flat side of the torch collar flush against a flat face defining the pattern, and being at a desired angle transverse of the tube wall, thus
(f) orienting the cutting axis at a desired angle to the tube wall,
(g) moving the torch collar along the flat face while
(h) maintaining the flat side of the torch collar flush on the flat face and
(i) cutting through the pipe wall along the cutting axis, thus
(j) cutting a desired axial pattern in the pipe at a desired angle through the pipe wall.

4,618,379
METHOD FOR THE CONTINUOUS ANNEALING OF STEEL STRIPS

Roberto Bruno, Via Cassia 1041, Roma; Nazzareno Azzeri, Via Catullo 57,, Pomezia (Roma); Pierluigi Antoniucci, Via San Florido 64, Citta di Castello (Perugia); Giorgio Bocci, Viale Quartara 29 L, Genova; Sandro Brizielli, Corso De Micheli 115/22, Chiavari (Genova), and Paolo Berardi, Via Licino Calvo 26, Roma, all of Italy

Continuation-in-part of Ser. No. 534,946, Sep. 21, 1983, abandoned. This application Jul. 12, 1985, Ser. No. 754,539
Claims priority, application Italy, Sep. 21, 1982, 12623 A/82
Int. Cl.[4] C21D *1/18*
U.S. Cl. 148—144 **10 Claims**

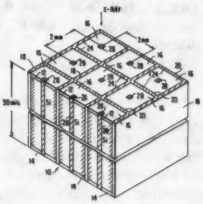


1. A method for continuously annealing a moving steel strip comprising the following sequential steps:
(a) heating the steel strip to annealing temperature;
(b) maintaining the annealing temperatures;
(c) first slow quenching the steel strips;
(d) second rapid quenching of the steel strip which comprises:
dipping the steel strip in an electrolytic pickling bath;
feeding said steel strip through liquid in said bath at a feeding rate effective to promote a laminar motion in layers of the liquid pickling bath at boundaries of the surface of the steel strip;
regulating current density applied to the steel strip, while it is being used as a cathode, to control the amount of hydrogen thus developed on its surface and, concurrently, to control the quenching speed of said steel strip;
increasing the current density applied to the steel strip while it is being used as a cathode, while maintaining the said laminar motion conditions in said pickling bath, in order to increase the quenching rates;
thereafter using the steel strip as an annode in said pickling bath;
(e) heating the steel strip to overaging temperature;
(f) maintaining said overaging temperature, and
(g) finally cooling the steel strip.

4,618,380
METHOD OF FABRICATING AN IMAGING X-RAY SPECTROMETER

George E. Alcorn, Reston, Va., and André S. Burgèss, Forestville, Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 18, 1985, Ser. No. 745,977
Int. Cl.[4] H01L *21/383, 21/385*
U.S. Cl. 148—187 **10 Claims**

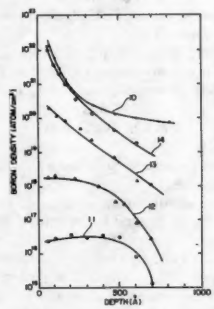


1. A process of fabricating a semiconductor array of detector cells comprising the steps of:
drilling a plurality of openings in a rectangular configuration completely through a body of semiconductor material to form a grid of discrete openings defining walls of adjoining cells therethrough;
diffusing a dopant material through said openings; and
forming within every cell a metal central electrode from the top surface of said semiconductive body to the bottom surface.

4,618,381
METHOD FOR ADDING IMPURITIES TO SEMICONDUCTOR BASE MATERIAL

Noritada Sato; Yasukazu Seki, and Osamu Ishiwate, all of Kanagawa, Japan, assignors to Fuji Electric Corporate Research and Development Ltd. and Fuji Electric Company Ltd., both of Kanagawa, Japan

Filed May 24, 1984, Ser. No. 613,778
Claims priority, application Japan, May 26, 1983, 58-93218; May 26, 1983, 58-93219
Int. Cl.[4] H01L *21/225;* H01J *17/00*
U.S. Cl. 148—189 **13 Claims**



1. A method of adding impurities to a semiconductor base material comprising the steps of:
placing the semiconductor base material in a vacuum chamber;
evacuating said vacuum chamber to a pressure of approximately 1×10^{-7} Torr after the semiconductor base material has been placed in said chamber;

pressurizing said chamber with a gas containing the impurities until the pressure in said chamber reaches 0.1 to 10 Torr, inclusive;

heating the semiconductor base material to a temperature not exceeding 400° C.; and

causing a glow discharge in said vacuum chamber.

4,618,382

SUPERPLASTIC ALUMINIUM ALLOY SHEETS

Yoshimitsu Miyagi, Ohyadaimachi; Mitsuo Hino, Tochigi, and Takehiko Eto, Ohyadaimachi, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 12, 1984, Ser. No. 660,126

Claims priority, application Japan, Oct. 17, 1983, 58-193598; Oct. 17, 1983, 58-193599

Int. Cl.⁴ C22C *21/00*

U.S. Cl. 148—415 **15 Claims**

1. A sheet of superplastic aluminum alloy exhibiting a superplastic elongation of 480% or higher selected from the group consisting of Al—Zn—Mg alloys and Al—cu alloys and having a maximum grain size below 30 μm on average which are obtained by a method which comprises the steps of:

(1) homogenizing a high strength aluminum alloy ingot comprising at least one solute element and at least one transition element under heating conditions;

(2) subjecting the alloy ingot to hot working to form an alloy plate;

(3) heating the alloy plate to a first temperature higher than a solution temperature of the at least one solute element and keeping it at the first temperature;

(4) cooling the alloy plate to a temperature at which the at least one solute metal element is precipitated and then keeping the alloy plate at the precipitating temperature for a time sufficient to cause fine intermetallic compounds of the at least one transition element and aluminum to precipitate uniformly;

(5) cooling the alloy plate at such a rate of cooling of 100° C./hour or higher to result in precipitates being obtained of the intermetallic compounds of the at least one solute element of a size finer than those obtained at a slower cooling rate; and

(6) subjecting the cooled alloy plate to cold working to the extent of 60 to 80%, to thereby achieve the above stated superplastic elongation property and grain size.

4,618,383

METHOD AND APPARATUS FOR THE MANUFACTURE OF PLASTIC BAGS HAVING INTERLOCKING PROFILE EXTRUSIONS

Fox J. Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 623,623, Jun. 22, 1984, Pat. No. 4,561,109, which is a continuation of Ser. No. 433,588, Oct. 12, 1982, abandoned. This application Mar. 5, 1985, Ser. No. 708,612

Int. Cl.⁴ B29D *5/00*

U.S. Cl. 156—66 **16 Claims**

1. An apparatus for attaching locking profile extrusions to a plastic film, comprising:

first and second serially arranged arcuate plate-like support sections for receiving and supporting a web of film;

means for moving a web of film over said first and then said second arcuate plate-like support sections;

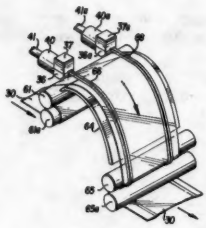
an extruding assembly positioned adjacent to said moving web, comprising first and second means for extruding first and second locking profiles onto said web while said web is positioned on said first arcuate plate-like support section, and means for supplying molten thermoplastic to said extruding assembly;

means for cooling said profiles while on said second arcuate plate-like support section to freeze said profiles onto said web; and

means for maintaining said moving web under tension as it passes over said first and second arcuate plate-like support sections so that upon release of said moving web contraction of said film upon release compensates for the contraction of said profiles as the profiles cool to prevent puckering of said moving web.

10. A method of attaching locking profile extrusions to a plastic film, comprising:

moving a web of film over first and second serially arranged arcuate plate-like support sections for receiving and supporting a film web;



extruding from an extruding assembly first and second locking profiles of molten thermoplastic onto said moving web;

joining said profiles and said web on a fusing section of said first arcuate plate-like support section;

freezing said profiles to said web on said second arcuate plate-like support section; and

maintaining said moving web under tension as it passes over said first and second arcuate plate-like support sections so that contraction of said film upon release of said tension compensates for the contraction of said profiles as said profiles cool to prevent puckering of said moving web.

4,618,384

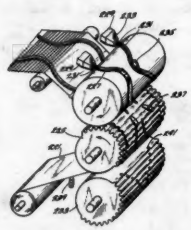
METHOD FOR APPLYING AN ELASTIC BAND TO DIAPERS

Reinhardt N. Sabee, 728 S. Summit St., Appleton, Wis. 54911

Filed Sep. 9, 1983, Ser. No. 530,544

Int. Cl.⁴ B31F *1/22*; B65C *1/00*

U.S. Cl. 156—205 **11 Claims**



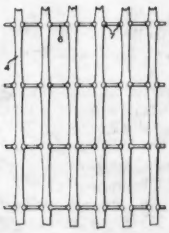
1. A method for continuously attaching an elastic member to a moving web to impart an elasticized character of a controlled varying intensity along its length, said method comprising the steps of:

(a) providing an extrusion die having a preselected variable cross-section;

(b) controlling the cross-sectional area of the extrudate die while simultaneously extruding a thermoplastic rubber in a heat softened substantially unstretched condition into an assembly station to thereby create an extrudate having a pre-selected variable cross-section to form an elastic ribbon member;

(c) cooling said elastic ribbon member;
(d) applying adhesive to said elastic member;
(e) feeding a web to the assembly station;
(f) forming corrugations in said web with peaks and valleys;
(g) adhering the substantially unstretched member to said web with the ribbon poritons having greater cross-section being applied to areas of the web requiring greater tension;
(h) maintaining said elastic member in a substantially unstretched condition contacting only the peaks until the adhesive sets up; and
(i) drawing the web and elastic member assembly under tension to the corrugations, thereby stretching said elastic member.

4,618,385
PRODUCTION OF PLASTIC MESH
Frank B. Mercer, Blackburn, England, assignor to P.L.G. Research Limited, Blackburn, England
Continuation of Ser. No. 510,252, Jul. 1, 1983, abandoned. This application Aug. 13, 1985, Ser. No. 765,186
Claims priority, application United Kingdom, Jul. 6, 1982, 8219477
Int. Cl.[4] B29C *55/06, 55/14*
U.S. Cl. 156—229 **27 Claims**



1. A method of making a plastics material mesh structure, comprising:
providing a plastics starting material which has a regular pattern of holes or depressions, the holes or depressions being in parallel lines, the distance between the holes or depressions of one line and those of the adjacent line being substantially greater than the distance between the holes or depressions in each line, the holes or depressions defining elongate, side-by-side main zones between the lines of holes or depressions and intermediate zones between the holes or depressions in each line, each of which intermediate zones is generally symmetrical about a line at right angles to the line of holes or depressions, the major part of the thickness of each intermediate zone being between planes defined by the outer faces of the main zones; and
drawing the starting material at a temperature above the glass transition temperature but low enough so that melt flow orientation is prevented, said drawing being only in a direction substantially parallel to the main zones while preventing substantial reduction of the pitch of the main zones though permitting reduction in width of each individual main zone, thereby stretching the main zones out into continuous, uniaxially-orientated main strands with the orientation therein extending substantially uniformly from end to end and generally parallel to the drawing direction, substantially decreasing the width of the main zones when forming the main strands, the distance between the holes or depressions of one line and those of the adjacent line being sufficiently greater than the distance between the holes or depressions in each line so that the force of contraction of each main strand as the main strand reduces in width causes said intermediate zones to stretch in a direction generally at right angles to the drawing direction to form discontinuous, uniaxially-orientated interconnecting strands which interconnect the main strands, whereby a biaxially-orientated mesh structure is produced comprising said orientated main strands and said orientated interconnecting strands with the orientation in the interconnecting strands extending generally at right angles to the main strands and the cross-sectional area of the mid-points of the interconnecting strands being less than the minimum cross-sectional area of the main strands, and in which mesh structure there is adjacent each end of each interconnection strand a zone of plastics material which is thicker than the material of the remainder of the interconnecting strand.

4,618,386
METHOD OF MAKING A MULTILAYERED CONTAINER
Tadao Yatsu, and Nobuya Hinooka, both of Yamaguchi, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 552,189, Nov. 15, 1983, abandoned. This application Jul. 8, 1985, Ser. No. 752,488
Claims priority, application Japan, Nov. 15, 1982, 57-198898
Int. Cl.[4] B29C *49/04*
U.S. Cl. 156—242 **2 Claims**

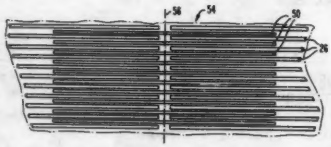
1. A method of making a multilayered container comprising (1) laminating a layer of molten polyethylene terephthalate (A) and a layer of polyester (B) consisting of a dicarboxylic acid component containing isophthalic acid in an amount exceeding 20 molar % and a glycol component comprising ethylene glycol in an amount exceeding 80 molar %, while layer (A) and layer (B) are maintained at a temperature of 230° to 350° C. and 180° to 260° C., respectively, under a pressure (gauge) of 20 kg/cm^2 or higher; (2) cooling and solidifying the laminate to a temperature of −10 to 30° C. so as to prepare a preform which comprises essentially of the layer of polyethylene terephthalate (A) and the layer of polyester (B); and (3) biaxially orienting and blow molding the preform at an orientation temperature of 80° to 130° C. under drawing of at least 1.5 times in the axial direction and at least 2 times in the radial directions.

4,618,387
SPLICING METHODS FOR AN EXTRUDED HANDRAIL
Marvin D. Fisher, Murrysville Boro, Pa., and Louis E. Bobsein, Basking Ridge, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Mar. 8, 1985, Ser. No. 709,874
Int. Cl.[4] B29C *47/00*; B32B *31/04, 31/18*
U.S. Cl. 156—244.11 **21 Claims**

1. A method of splicing first and second ends of a length of extruded flexible handrail to form a continuous loop, with the handrail including a body portion having a substantially C-shaped cross-sectional configuration which defines a substantially flat inner drive surface, and with the body portion being formed of an elastomeric, thermoplastic material having a plurality of spaced, longitudinally extending inextensible members embedded therein which extend substantially from end-to-end of the length, comprising the steps of:
squaring the first and second ends of said length,
aligning the first and second ends of said length to form a tight butt joint, with each end of each inextensible mem-

ber adjacent to the first end of said length being aligned with a like positioned end of an inextensible member adjacent to the second end of said length, and with said aligned ends of said inextensible members being spaced from one another in the tight butt joint to prevent interference,

cutting parallel, longitudinally extending grooves into the flat inner drive surface of the body portion, with said grooves being located in the spaces between the plurality of inextensible members and extending through, and for a predetermined dimension on each side of, said butt joint,



placing predetermined lengths of inextensible members and elastomeric material into the grooves, to interleave said placed inextensible members with said aligned embedded inextensible members, with certain of said placed inextensible members extending for a dimension of at least about twelve inches on each side of said butt joint,

and bonding the added elastomeric material to the surfaces which define the grooves, to secure the predetermined lengths of inextensible members therein.

4,618,388

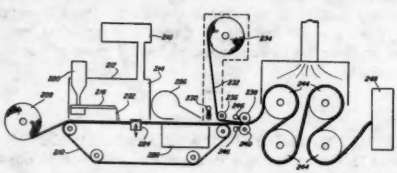
WATER REMOVING FILTER MEDIA AND METHOD OF MAKING THE SAME

William R. Ayers, Bement, Ill., assignor to Central Illinois Manufacturing Co., Bement, Ill.

Division of Ser. No. 447,909, Dec. 8, 1982, which is a continuation-in-part of Ser. No. 413,981, Sep. 2, 1982. This application Sep. 11, 1984, Ser. No. 649,502

Int. Cl.[4] B01D *39/16*

U.S. Cl. 156—284 **6 Claims**



1. A method of making a laminated, water absorbing mechanical filter media comprising the steps of:

placing a water absorbing polymer in granular form on a fiberglass mat;

dispersing the polymer in the mat;

wetting the polymer with water at a surface of the mat sufficiently to make said surface sticky;

applying a layer of filter paper to said surface while said surface is sticky;

pressing the mat and the layer together to cause the polymer to contact the layer; and

extracting sufficient water from the resulting laminate to cause the polymer to secure the mat and the layer together.

4,618,389

PROCESS FOR BONDING HEAT CURABLE SILICONE RUBBER TO A SUBSTRATE USING AN AQUEOUS PRIMER COMPOSITION

Michael K. Agodoa, Toledo, Ohio, assignor to SWS Silicones Corporation, Adrian, Mich.

Continuation of Ser. No. 491,158, May 4, 1983, abandoned. This application Jan. 14, 1985, Ser. No. 691,357

Int. Cl.[4] C09J *5/02*

U.S. Cl. 156—307.5 **5 Claims**

1. An improved method for bonding a heat curable silicone rubber composition to a substrate which comprises applying a heat curable silicone rubber composition to a substrate and thereafter curing the silicone rubber composition at an elevated temperature, the improvement which comprises coating the substrate prior to the application of the silicone rubber composition with an aqueous primer composition consisting essentially of from 0.5 to 20 percent by weight based on the weight of the primer composition of an 1 alkenyltrihydrocarbonoxysilane having the formula

$$RSi[(OR'')_nOR']_3$$

where R is an alkenyl radical having from 2 to 6 carbon atoms, R′ is a monovalent hydrocarbon radical having from 1 to 10 carbon atoms, R″ is a divalent hydrocarbon radical having from 1 to 6 carbon atoms and n is a number of from 0 to 4, an aqueous miscible solvent which is present in an amount of from 10 to 25 percent by weight based on the weight of the aqueous primer composition and having a boiling point up to 180° C., water in an amount of from 55 to 82 percent based on the weight of the aqueous primer composition and an organic acid in an amount sufficient to provide a pH below 7, and thereafter drying the coated substrate.

4,618,390

METHOD FOR PREPARING LAMINATED ARTICLES

Clois E. Powell, Westerville, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 504,027, Jun. 13, 1983, abandoned. This application Aug. 14, 1984, Ser. No. 689,641

Int. Cl.[4] C09J *5/02*

U.S. Cl. 156—307.3 **14 Claims**

1. A method for laminating a flexible substrate and a rigid wood substrate which comprises:

(I) consolidating said substrates through an adhesive medium having a pot life of at least one hour consisting essentially of:

(a) a colloidal aqueous dispersion of a hydroxyl functional acrylic polymer;

(b) a polyalkylene glycol;

(c) a thickener to permit dispersion of hardener, control of processing characteristics, and control of penetration into wood substrates;

(d) a dispersed organic solution of protected polyisocyanate hardener in hydrophobic solvent; and

(e) water; and

(II) effecting the cure of said adhesive at ambient or elevated temperature.

4,618,391

AUTOMATIC DEVICE FOR BRINGING INTO REGISTER A TOOL MOUNTED ON A ROTARY CYLINDER FOR PROCESSING PRODUCTS IN SHEET FORM

Mario Torti, Lyons, and Emilio Fernandez, Bron, both of France, assignors to S. A. Martin, Villeurbanne, France

Filed Aug. 1, 1984, Ser. No. 636,763

Claims priority, application France, Aug. 18, 1983, 83 13577

Int. Cl.[4] B26D *5/20*

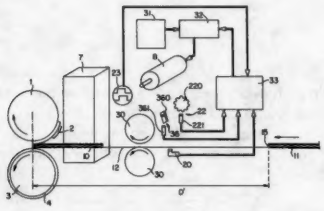
U.S. Cl. 156—353 **1 Claim**

1. Apparatus for achieving automatic register for a processing installation for products in sheet form, which utilizes a

rotary cylinder and comprising means for the cyclic feeding of sheets to a tool holder cylinder (1) driven by the general kinematic chain of a machine in such a manner that the interval of introduction of the successive sheets corresponds to the development of the tool holder, or to a multiple thereof, the drive of the tool holder cylinder comprising a device (7) for angular adjustment, relative to the general kinematic chain, under the control of an adjusting motor, said apparatus comprising

(a) a first coding device (22) connected to the general kinematic chain (30) and supplying information representing the theoretical speed of advance of the sheets;

(b) a second coding device (23) connected to the adjustment device (8) and providing information representing the angular adjustment value given to the tool holder;



(c) a first detector (20) of the passage of a selected reference mark (15) on the sheet, this detector being disposed upstream of the tool holder cylinder at a distance less than the theoretical distance between two successive sheets;

(d) a second detector (36) coupled to the general kinematic chain (30) and providing electric pulses linked to the feed cycle of the sheets; and

(e) a computing and correction unit receiving and analyzing the information provided by said first and second detectors (20, 36) and coding devices (22, 23) and accordingly providing for each cycle of said machine one or more commands for the correction of the tool holder in response to the difference between the actual position of the sheet introduced and its theoretical position.

4,618,392

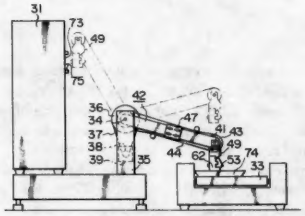
LABEL ADHERING APPARATUS

Mitsuo Uchimura, and Satoru Uematsu, both of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1983, Ser. No. 486,490

Int. Cl.[4] B65C 9/08, 9/36

U.S. Cl. 156—384 **16 Claims**



1. Label adhering apparatus comprising:

A label printer having a label issuing port for use in issuing a label;

a mount block on which an object to be labeled is mounted;

an arm having one end rotatably held and the other end reciprocated between a label issuing position at said label issuing port and a label adhering position for said object to be labeled;

a driving shaft for reciprocatably rotating the arm;

a fixed pulley fixed to a rotary center of said arm;

a rotary pulley having the same diameter as that of the fixed pulley and rotatably arranged at said other end of said arm;

an endless belt wound around the rotary pulley and said fixed pulley so as to connect both of said pulleys; and

a label adhering means fixedly connected to said rotary pulley;

the label adhering means further including:

a frame;

a pivotable frame mounted on said frame;

rollers rotatably mounted on said pivotable frame;

electromagnetic driving means mounted on said pivotable frame;

label pressing rollers connected to the electromagnetic driving means and movable to and away from a lower outer circumference of said rollers, and further rotatably connected to said frame around a lateral axis; and

operative means for pivotably rotating said pivotable frame in such a direction that said label pressing rollers are displaced along an outer circumference of said rollers from below said rollers to side portions thereof in response to movement of said label adhering means toward a labeling adhering position.

4,618,393

HAND LABELING DEVICE

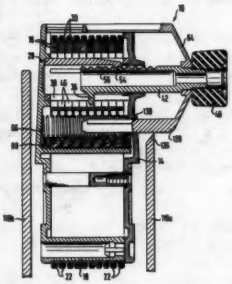
Heinrich Volk, Beerfelden, Fed. Rep. of Germany, assignor to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Feb. 21, 1985, Ser. No. 703,943

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406810

Int. Cl.[4] B65C 9/46, 11/02

U.S. Cl. 156—384 **6 Claims**



1. Hand labeling device for imprinting and dispensing self-adhesive labels comprising a housing, a printing mechanism which is movable therein between a raised inoperative position and a lowered printing position and which comprises a plurality of axially adjacent setting wheels with which type carriers carrying printing types are in a drive connection, and a setting shaft which extends in the direction of the axis of the setting wheels is connected to the printing mechanism, projects outwardly at a housing wall and is displaceable at a side face of the printing mechanism between an inserted position and an extended position and with the aid of which the setting wheels can be moved relatively to each other in such a manner that desired printing types on the type carriers move into a printing zone at the printing mechanism, characterized in that to the setting shaft (42) a stop body (128) extending parallel thereto is connected which is displaceable with the setting shaft (42) between an extended and an inserted position and that in the path which the stop body (128) describes in the extended position when the printing mechanism (10) is lowered into the

printing position a stop edge (126) fixed with respect to the housing is disposed.

4,618,394

ONE-SIDED CORRUGATED CARDBOARD MACHINE WITH SUCTION DEVICE

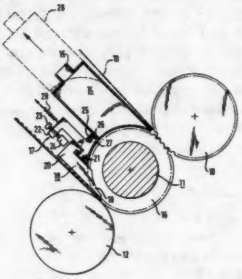
Martin Hoffmann, Tangstedt, Fed. Rep. of Germany, assignor to Werner H. K. Peters Maschinenfabrik GmbH, Hamburg, Fed. Rep. of Germany

Filed Oct. 12, 1984, Ser. No. 661,165

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1983, 8331823[U]

Int. Cl.⁴ B31F *1/00, 1/28*

U.S. Cl. 156—473 **8 Claims**



1. A one-sided corrugated cardboard machine comprising an upper fluted roller and a lower fluted roller, a pressure roller associated with the lower fluted roller, a suction box essentially extending the width of the lower fluted roller and connected to a vacuum source and arranged on that side of the lower fluted roller which is not covered by the corrugated material web and juxtaposed to said upper fluted roller, said suction box creating a vacuum in annular suction grooves of the lower fluted roller, and sealing sheet metal members engaging within the suction grooves on the uncovered side of said lower fluted roller and juxtaposed to said pressure roller, characterized by a supporting beam positioned between said sealing sheet metal members and said suction box and supporting said sheet metal members and said suction box, and said suction box and said sealing sheet metal members being independently adjustable relative to said supporting beam for independent movement of either of said sealing sheet metal members and said suction box relative to said supporting beam.

4,618,395

CUTTING IMPLEMENT FOR REMOVING PLASTIC SEALING STRIPS FROM JOINTS BETWEEN REINFORCED CONCRETE ELEMENTS

Hermann Breucha, Mittelstadtstrasse 52, D-7210 Rottweil, Fed. Rep. of Germany

Filed May 17, 1985, Ser. No. 735,312

Claims priority, application Fed. Rep. of Germany, May 19, 1984, 34186891

Int. Cl.⁴ B32B *31/18*

U.S. Cl. 156—584 **17 Claims**

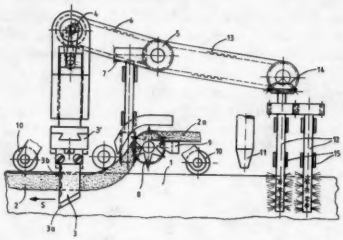
1. In a cutting implement for removing a plastic sealing strip from a joint between reinforced concrete elements, comprising

cutting blade means adapted to be inserted into said joint at said sealing strip,

the improvement residing in that

said cutting blade means comprise blade holding means and two parallel cutting blades, which are transversely spaced apart and transversely adjustable relative to each other,

drive means comprising a rotatable concentric member are coupled to said cutting blades and operable to reciprocate said cutting blades in their longitudinal direction in phase opposition to each other to sever said plastic sealing strip from said reinforced concrete elements when said cutting blades have been inserted into said joint on opposite sides of said sealing strip, and



strip conveying means are disposed on one side of said cutting blades and adapted to receive and withdraw said sealing strip from said cutting blades when said sealing strip has been severed from said reinforced concrete elements.

4,618,396

GAAS SINGLE CRYSTAL AND PREPARATION THEREOF

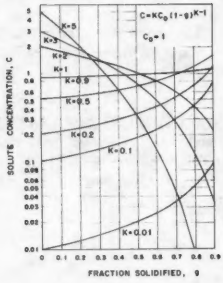
Takashi Shimoda, and Masami Sasaki, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 27, 1984, Ser. No. 675,400

Claims priority, application Japan, Dec. 1, 1983, 58-227247

Int. Cl.⁴ B01J *17/00;* C01B *27/00;* C04B *35/00*

U.S. Cl. 156—605 **8 Claims**



1. A GaAs single crystal suitable for use as a transistor, an LED or a laser diode, comprising a GaAs crystal doped with an impurity selected from the group consisting of In, Al, C and S, in which fluctuation of the concentration of said impurity in said crystal is less than 20% in any direction.

4. A process for preparing a GaAs single crystal suitable for use as a transistor, an LED or a laser diode, said crystal comprising a GaAs crystal doped with an impurity selected from the group consisting of In, Al, C and S, in which fluctuation of the concentration of said impurity in said crystal is less than 20% in any direction, said process comprising the steps of:

pulling up a single crystal from a raw material melt comprising Ga and As or a GaAs compound as well as at least one impurity selected from the group consisting of In, Al, C and S while controlling the concentration of As so as to keep a distribution coefficient of the impurity in GaAs within 1 ± 0.1.

4,618,397

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE HAVING A PRESSURE SENSOR

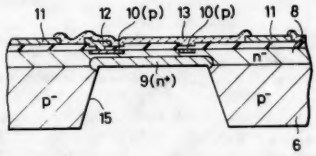
Isao Shimizu, Tamamura, and Kazuji Yamada, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 563,748, Dec. 21, 1983. This application Nov. 27, 1985, Ser. No. 802,431

Claims priority, application Japan, Dec. 24, 1982, 57-226274

Int. Cl.[4] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—628 9 Claims



1. In a method of manufacturing a semiconductor device wherein diffused resistors for a pressure sensor are formed in a front surface of a semiconductor crystal body, a rear surface of which is thereafter etched partly so as to put a part of the body into a membrane portion; a method of manufacturing a semiconductor device having a pressure sensor characterized in that, in advance of the etching step, a buried layer which has an impurity concentration higher than that of the semiconductor body and which has the gradient of the impurity concentration is provided in said semiconductor body, whereupon said body is partly etched from its rear surface while an etching rate is being controlled by the high concentration buried layer.

4,618,398

DRY ETCHING METHOD

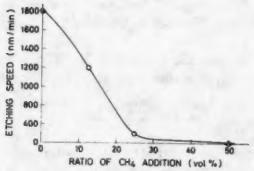
Makoto Nawata; Ryoji Fukuyama; Norio Nakazato, and Masaharu Nishiumi, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 11, 1985, Ser. No. 700,287

Claims priority, application Japan, Feb. 13, 1984, 59-22805

Int. Cl.[4] C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—643 2 Claims



1. A dry etching method wherein a gaseous mixture of boron trichloride, chlorine and hydrocarbon, where the ratio of the content of the chlorine to the sum of the contents of the boron trichloride and the chlorine is 40 to 80% by volume and the ratio of the content of the hydrocarbon to the sum of the contents of boron trichloride and chlorine is 5 to 30% by volume, is used as an etching gas, and said etching gas is converted into plasma to etch aluminum or its alloys with said plasma.

4,618,399

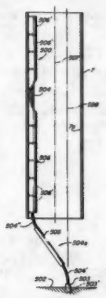
WOBBLE TUBE EVAPORATOR WITH WHIP ROD FLUID DISTRIBUTOR

Yao T. Li, Huckleberry Hill, Lincoln, Mass. 01773

Continuation-in-part of Ser. No. 367,251, Apr. 7, 1982, Pat. No. 4,441,963, which is a continuation of Ser. No. 201,380, Oct. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 961,452, Nov. 16, 1978, Pat. No. 4,230,529. This application Apr. 9, 1984, Ser. No. 598,473

Int. Cl.[4] B01D *1/22, 3/04*

U.S. Cl. 159—6.2 30 Claims



1. In a fluid evaporation apparatus having (i) a reference number, (ii) at least one heat transfer tube aligned about a generally vertical axis adjacent said reference member, (iii) means to drive said heat transfer tube to revolve about a wobbling center on said vertical axis without rotating the transfer tube, and means for directing a stream of said fluid toward the inner surface of said tube, the wobble motion imparted to said tube serving to cause said stream of said fluid to cling to the inner surface of said tube away from the wobbling center and form a revolving flow stream that wipes the inside surface of the tube, the improvement comprising a whip rod that lies within said inner tube surface, said whip rod being flexible to conform to irregularities in said surface when driven against the surface by the centrifugal force developed by the whip rod sliding over said inner surface in response to said wobbling motion, means for anchoring a first end of said whip rod to the reference member near the longitudinal vertical axis of said tube, said anchoring means allowing said whip rod to lie within said tube extending generally vertically against and revolving about said inner surface of said tube during said wobbling to distribute said fluid stream in a higly thin, uniform film over said inner surface, said highly thin film presenting a low heat resistance to facilitate said evaporation.

4,618,400

WASTEPAPER DEINKING PROCESS

Donald L. Wood, and Herbert E. Fried, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 687,110, Dec. 28, 1984, abandoned. This application Jan. 10, 1986, Ser. No. 817,803

Int. Cl.[4] D21C *5/02*

U.S. Cl. 162—5 8 Claims

1. A process for the deinking of wastepaper stocks which comprises steps for

a. converting the wastepaper to a pulp,

b. contacting the pulp with an aqueous medium of alkaline pH containing between about 0.2 and 2 percent by weight, calculated on dry weight of the pulp, of a deinking agent which is one or a mixture of thiol ethoxylate compounds of the formula

$$RS—CH_2CH_2O)_nH,$$

wherein R represents a C_9 to C_{18} alkyl group and n has an average value between about 3 and 20,

c. treating the resulting pulp-containing medium to remove suspended or dispersed ink therefrom, and

d. treating the pulp-containing aqueous medium, subsequent to step c, with an oxidizing agent at a temperature of at least about 75° C. and at a pH of at least about 12.0 to bleach the pulp and to convert all or part of the thiol ethoxylate deinking agent to non-surface-active matter.

4,618,401
BATTERY SEPARATOR MATERIAL

Warren J. Bodendorf, Montgomery, Mass., assignor to Texon, Inc., Farmington, Conn.

Division of Ser. No. 551,072, Nov. 14, 1983, Pat. No. 4,529,677, which is a continuation-in-part of Ser. No. 445,857, Dec. 12, 1982, abandoned, which is a continuation-in-part of Ser. No. 345,173, Feb. 2, 1982, abandoned. This application Dec. 17, 1984, Ser. No. 682,546

Int. Cl.[4] D21H *3/44, 5/18*

U.S. Cl. 162—138 **9 Claims**

1. A method for forming a battery separator material which comprises the steps of:

a. forming an aqueous dispersion which comprises polyolefin fiber in an amount sufficient to provide between about 5 to about 20 percent by weight of polyolefin fiber in the final separator material; polyester fiber in an amount sufficient to provide between about 2 to about 15 percent by weight of polyester fiber in the final separator material, glass fiber in an amount sufficient to provide between 12 to about 20 percent by weight of glass fiber in the final separator material, diatomaceous earth in an amount sufficient to provide between about 40 to about 75 percent by weight of diatomaceous earth in the final separator material;

b. stabilizing said aqueous dispersion in the presence of an anionic dispersing agent to form an aqueous dispersion of substantially non-flocculated agglomerates comprising said polyolefin fiber, polyester fiber, glass fiber, and diatomaceous earth;

c. adding an acrylate copolymer binder, which is anionic in character and which includes a silane coupling agent attached to the polymeric backbone, in an amount sufficient to provide between about 7 to about 20 percent by weight of binder in the final separator sheet material;

d. conveying the dispersion of step c. to a porous support for receiving the dispersion;

e. adding a cationic flocculating agent to said conveyed dispersion before delivering said dispersion to said porous support;

f. distributing and draining the dispersion provided by step e. on said porous support, to form a wet web; and

g. drying the web.

4,618,402
SAFETY MEANS, PAPER AND DOCUMENT AGAINST FALSIFICATION BY CHEMICAL AGENT

Michel Camus, Charavines, France, assignor to Arjomari-Prioux, Paris Cedex, France

Filed Jul. 24, 1985, Ser. No. 758,361

Claims priority, application France, Aug. 10, 1984, 84 12704; Apr. 12, 1985, 85 05574

Int. Cl.[4] D21H *5/10*

U.S. Cl. 162—140 **20 Claims**

1. A non-fluorescent safety paper containing Fe(III) ions stabilized against reduction to Fe(II) ions from constituents of the paper with a sufficient amount of an oxidizing agent which prevents substantial reduction of Fe(III) to Fe(II) by the paper constituents, and a substantially colorless Fe(II) ions complexing agent which produces a strong permanent color in the presence of Fe(II) ions, said stabilized Fe(III) ions being present in sufficient quantity to form a sufficient amount of Fe(II) ions when exposed to a reducing source originating external to said paper to form a permanent visible color with said complexing agent.

4,618,403
METHOD OF STABILIZING METAL-SILICA COMPLEXES IN ALKALI METAL HALIDE BRINES

David L. Fair, Chattanooga; David D. Justice, Cleveland, both of Tenn., and Pilar P. Kelly, Spartanburg, S.C., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 544,677, Oct. 24, 1983, Pat. No. 4,515,665. This application May 2, 1985, Ser. No. 729,787

The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.

Int. Cl.[4] C25B *1/46*

U.S. Cl. 204—98 **15 Claims**

12. A process for electrolysis in a membrane electrolytic cell for producing an alkali metal hydroxide which comprises feeding a concentrated alkali metal halide brine containing a complex of at least one complex-forming element and silica at a pH of from about 4 to about 12 to said membrane electrolytic cell, and electrolyzing said alkali metal halide brine under conditions which maintain the pH of said alkali metal halide brine above the decomposition value of said complex.

4,618,404
ELECTRODE FOR ELECTROCHEMICAL PROCESSES, METHOD FOR PREPARING THE SAME AND USE THEREOF IN ELECTROLYSIS CELLS

Alberto Pellegri, Luino, Italy, assignor to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Division of Ser. No. 791,266, Oct. 25, 1985. This application Feb. 10, 1986, Ser. No. 827,590

Claims priority, application Italy, Nov. 7, 1984, 83633 A/84

Int. Cl.[4] C25B *1/24, 11/08*

U.S. Cl. 204—128 **14 Claims**

1. A process for generating halogen which comprises electrolyzing an aqueous halide in an electrolytic cell having an anode and a cathode, said cathode comprising an inert metallic substrate and having an external or superficial coating comprising an inert electroconductive platinum group metal ceramic and an intermediate pre-coating or interlayer between said substrate and said external or superficial coating, said pre-coating or interlayer comprising an inert metal matrix having dispersed therein particles of a ceramic material which is compatible with the external or superficial coating.

4,618,405
PROCESS FOR THE ELECTROCHEMICAL ROUGHENING OF ALUMINUM FOR USE AS PRINTING PLATE SUPPORTS, IN AN AQUEOUS MIXED ELECTROLYTE

Dieter Mohr, Schlangenbad, and Werner Frass, Wiesbaden-Naurod, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 23, 1985, Ser. No. 726,244

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1984, 3415364

Int. Cl.[4] C25F *3/04*

U.S. Cl. 204—129.75 **16 Claims**

1. A process for the electrochemical roughening of a material selected from aluminum and aluminum alloys, comprising the steps of:

placing the material in an aqueous mixed electrolyte solution containing HCl and at least one additional electrolyte selected from condensed phosphoric acids, amidosulfonic acid, and the water-soluble alkali metal salts and ammonium salts of any of the above acids; and

subjecting said material to the action of alternating current to effect roughening of the material surface, said roughening rendering said material suitable for use in a printing plate support;

wherein the mixed electrolyte contains from about 0.5 to about 10% by weight of HCl and from about 0.05 to about 5.0% by weight of the additional electrolyte;

wherein said aqueous mixed electrolyte solution is at a temperature of from about 20° C. to about 60°, the density of said alternating current is from about 3 to about 200 A/dm^2.

4,618,406

GRAPHITE-COATED TUBE AND PROCESS FOR PRODUCING THE SAME

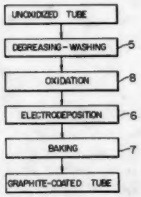
Yoshikazu Wakashima, and Sachio Shimada, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 085,232, Oct. 16, 1979, abandoned. This application Nov. 22, 1982, Ser. No. 443,530

Claims priority, application Japan, Oct. 17, 1978, 53-127725

Int. Cl.^{4} C25D *13/00*; G21C *3/06*

U.S. Cl. 204—181.1 **14 Claims**



1. A process for producing a graphite-coated zircalloy tube, which comprises oxidizing an inside surface of an unoxidized zircalloy tube to form a zirconium oxide layer having a thickness of not more than 5,000 Å on the inside surface, depositing a graphite layer on the zirconium layer by electrodeposition, and baking the graphite layer-deposited tube.

4,618,407

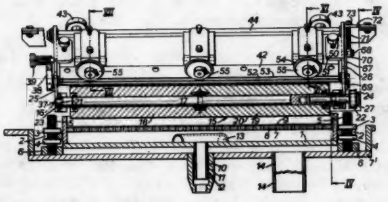
GALVANO-TECHNICAL DEVICE FOR LOCALLY APPLYING A METAL LAYER TO AN ELONGATE METAL TAPE OR THE LIKE

Peter J. G. Loermans, BW Bergharen, Netherlands, assignor to Meco Equipment Engineers B.V., Netherlands

Filed Feb. 9, 1984, Ser. No. 578,581

Int. Cl.^{4} C25D *17/00, 17/16*

U.S. Cl. 204—206 **18 Claims**



1. An electroplating apparatus for locally applying a metal layer to an elongate metal tape or to metal objects united in an elongate tape or the like in which the tape, acting as a first electrode, is guided along a main roller coupled to a frame so as to rotate about a rotary axis in operation and be dipped at least partly in an electrolyte solution contained in a reservoir having a second electrode and arranged below said main roller, and in which the tape is displaced generally parallel to the rotary axis of the main roller in a manner such that the parts of the tape to be provided with the metal layer come into contact with the main roller, wherein the improvement comprises a guide surface, disposed adjacent the main roller and stationery during operation in the direction of displacement of the tape, along which guide surface the tape is displaced during operation, and a guide rim protruding out of the guide surface remote from the main roller and extending generally parallel to the rotary axis of the main roller, against which guide rim an edge of the elongate tape is pressed, and a plurality of wheels pressing the tape against the guide surface and the tape edge against the guide rim, the wheels having their rotational axes at an acute angle to the direction of displacement of the tape.

4,618,408

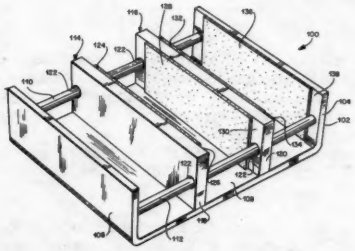
CASTING APPARATUS FOR ELECTROPHORETIC GEL TRAY

Richard Malavarca, South Orange, and Thomas Livelli, Lyndhurst, both of N.J., assignors to Lab Stuff, Inc., South Orange, N.J.

Filed Nov. 29, 1984, Ser. No. 675,984

Int. Cl.^{4} G01N *27/28*

U.S. Cl. 204—299 R **20 Claims**



1. An apparatus for casting an electrophoretic separation medium within a received tray having open ends, said apparatus comprising a housing, first sealing means and second sealing means arranged spaced apart within said housing for sealing the open ends of said tray when brought into engagement therewith, said first sealing means supporting a first gasket for sealing one open end of said tray and arranged opposing said second sealing means, said second sealing means supporting a second gasket and arranged opposing said first gasket for sealing the other open end of said tray, said first sealing means being movable with respect to said second sealing means, and guide means in operative association with said first sealing means for adjusting the spaced apart relationship between said first sealing means and said second sealing means so as to receive said tray therebetween with said open ends in sealing engagement with said first gasket and said second gasket.

4,618,409

ELECTROPHORETIC SEPARATOR

Peter C. Lovegrove, Didcot, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Jan. 14, 1985, Ser. No. 691,001

Claims priority, application United Kingdom, Jan. 20, 1984, 8401510

Int. Cl.^{4} G01N *27/28*

U.S. Cl. 204—300 R **7 Claims**

1. A continuous flow electrophortic separator comprising a cylindrical stator, a concentric tubular rotor defining an annular chamber between the stator and the rotor, an electrode incorporated in the stator, an electrode incorporated in the rotor, means for causing a carrier liquid to flow through the chamber, and an inlet means in the stator for injecting a migrant material into the carrier liquid, the inlet means defining:

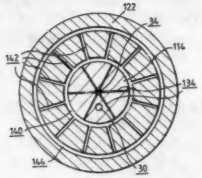
a supply duct for the supply of the migrant material,

a first annular chamber,

a plurality of ducts providing communication between the supply duct and the first annular chamber,

a circumferential slot around the periphery of the stator,

a second annular chamber coaxial with the stator and in fluid communication with the slot, and of greater width than the corresponding width of the slot,



and a plurality of channels providing fluid communication between the first annular chamber and the second annular chamber, the channels being not coplanar with the slot, so that in use the flux of the migrant material is substantially the same through all parts of the slot.

4,618,410

SHALE OIL DEARSENATION PROCESS

Frederick E. Brinckman, Derwood, Md.; Thomas F. Degnan, Jr., Yardley, Pa., and Carl S. Weiss, Racine, Wis., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Continuation of Ser. No. 665,875, Oct. 29, 1984, abandoned. This application Nov. 4, 1985, Ser. No. 794,590

Int. Cl.[4] C10G *55/04*

U.S. Cl. 208—97 **6 Claims**

1. A method for producing a dearsenated shale oil product from a shale oil feedstock contaminated with more than 4 ppmw arsenic in the form of at least one soluble arsenic comprising:

(a) forming a coker distillate having an arsenic content lower than that of the shale oil feedstock by coking at least a portion of said feedstock at a temperature between 750° and 2000° F.;

(b) contacting said coker distillate with water; and

(c) separating said water from said coker distillate to produce a shale oil product having less than 3 ppmw soluble arsenic.

4,618,411

ADDITIVE COMBINATION AND METHOD FOR USING IT TO INHIBIT DEPOSIT FORMATION

Ghazi B. Dickakian, Kingwood, Tex., assignor to Exxon Chemical Patents Inc., Florham Park, N.J.

Filed Jun. 4, 1985, Ser. No. 741,078

Int. Cl.[4] C10G *9/16*

U.S. Cl. 208—48 AA **14 Claims**

1. A method for inhibiting deposit formation on the contact surfaces of structures confining heated hydrocarbon fluids comprising the step of introducing into said hydrocarbon fluids at least an inhibiting amount of thiophene-containing polycondensed aromatic/naphthenic compounds of number average molecular weight ($\overline{Mn}$) from 200 to 1,000 and a macrocyclic polyamine having 2 to 8 nitrogen atoms per molecule.

4,618,412

HYDROCRACKING PROCESS

Carl W. Hudson, and Glen P. Hamner, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 31, 1985, Ser. No. 760,835

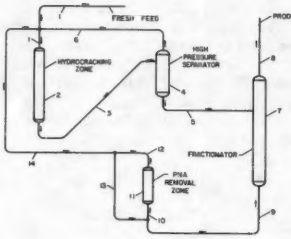
Int. Cl.[4] C10G *65/10, 65/18*

U.S. Cl. 208—59 **24 Claims**

1. A catalytic hydrocracking process which comprises:

(a) contacting a hydrocarbon feed having a propensity to form polynuclear aromatic hydrocarbon compounds in a hydrocracking zone with added hydrogen and a metal promoted crystalline zeolite hydrocracking catalyst at elevated temperature and pressure sufficient to produce substantial conversion of said feed to lower boiling products;

(b) condensing the hydrocarbon effluent from said hydrocracking zone and separating the same into a low boiling hydrocarbon product and unconverted hydrocarbon oil containing small quantities of polynuclear aromatic hydrocarbon compounds;



(c) contacting at least a portion of said uncoverted hydrocarbon oil containing polynuclear aromatic compounds with a catalyst which contains elemental iron and one or more of an alkali or alkaline-earth metal, or compound thereof, in the presence of hydrogen, at conditions inclusive of temperatures ranging from about 225° C. to about 430° C. sufficient to hydrogenate and hydrocrack the polynuclear aromatic hydrocarbon compounds; and

(d) recycling unconverted hydrocarbon oil having a reduced concentration of polynuclear aromatic compounds resulting from step (c) to said hydrocracking zone.

4,618,413

METHOD FOR EXTRACTING NICKEL AND VANADIUM COMPOUNDS FROM OILS

Robert E. Overfield, Washington, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jul. 15, 1985, Ser. No. 755,089

Int. Cl.[4] C10G *17/00;* C10C *3/00*

U.S. Cl. 208—251 R **10 Claims**

1. A method for the extraction of vanadium or nickel metalloporphyrinic compounds from hydrocarbon oil containing such compounds comprising the step of contacting said oil with a solvent having a δ_h of between 0 and 6, a δ_p of between 8.6 and 10.7 and a δ_d of between 8.7 and 10.00.

4,618,414

PROCESS FOR SEPARATING MINERAL ULTRA-FINE GRAIN FROM WASHINGS OBTAINED IN COAL PROCESSING OR FROM COAL SLURRIES

Hans-Georg Hartan, Kevelaer; Werner Padberg, Dudweiler, and Dietrich Müller, Wadgassen, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Stockhausen GmbH, Krefeld and Saarbergwerke AG, Saarbrucken, both of, Fed. Rep. of Germany

Continuation of Ser. No. 556,827, Dec. 1, 1983, abandoned. This application Jun. 6, 1985, Ser. No. 741,765

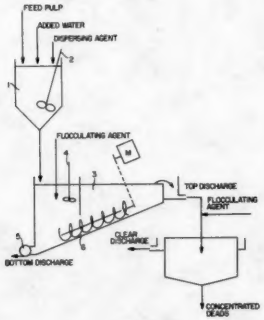
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1982, 3244898

Int. Cl.[4] B03D *3/06*

U.S. Cl. 209—5 **8 Claims**

1. In the separation of coal from ash containing mineral material by treating a slurry thereof the improvement which comprises first adding to the slurry a selective dispersing agent for the mineral finest grain, said dispersing agent being an organic, synthetic polymer having a molecular weight of $\leqq$10,000 g/mol and selected from the group consisting of polyacrylic acid, polymethacrylic acid, copolymers of acrylic

acid/acrylamide, methacrylic acid/methacrylamide of from 5 to 99% by weight acrylic acid/methacrylic acid, copolymers of acrylic acid/acrylates, poly-2-acrylamido-2-methylpropanesulphonic acid, salts of poly-2-acrylamides-2-methylpropanesulphonic acid, copolymers of poly-2-acrylamido-2-methylpropanesulphonic acid with arylamide and copolymers of salts of poly-2-acrylamido-2-methylpropanesulphonic acid with



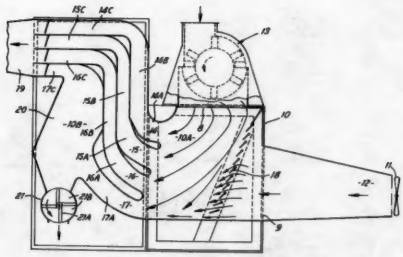
acrylamide, and acrolein polymers, stirring to disperse the solids, adding an anionic or non-ionic flocculating agent to the dispersion thereby selectively to flocculate the coal and coarser mineral particles while leaving dispersed the ash-containing mineral particles of ≦32 μm separating the flocculated coal and larger mineral particles from the dispersion, the absence of the particles of ≦32 μm resulting in improved subsequent separation.

4,618,415

TOBACCO SEPARATOR

Anthony J. Vecchio, and John H. Hudson, Jr., both of Richmond, Va., assignors to AMF Incorporated, White Plains, N.Y.

Filed Aug. 31, 1984, Ser. No. 646,657
Int. Cl.[4] B07B *4/02*; B02C *23/10*
U.S. Cl. 209—134 **5 Claims**



1. A tobacco separator for separating tobacco laminae from mid-rib or stem matter of threshed tobacco, comprising the combination

a separating chamber having top, bottom and side walls,

an inlet in the top of said chamber for admitting downwardly into said chambers a mixture of tobacco laminae and stems,

an air inlet in one side of the chamber for establishing an air flow across the chamber,

a plurality of discharge openings arranged vertically one above the other in the side wall of the chamber opposite the air inlet for receiving respective portions of the air flow,

the bottom of the lowermost one of said discharge openings being no higher than the level of the bottom of the separating chamber,

means for creating a flow of air through the air inlet on one side wall of the chamber, horizontally across the chamber, and into said discharge openings on the opposite side wall of the chamber,

said air flow extending from substantially the top to the bottom of the chamber and substantially completely across its dimension that is transverse to the air flow,

means located as said air inlet for establishing a nonuniform speed distribution of air flow, in a vertical plane, through said separating chamber so that the substantially horizontally moving air has higher speeds at the bottom of the chamber than at the top of the chamber,

said air speeds being proportioned so that stems fall to the bottom of the chamber and are swept out said lowermost discharge opening by the higher air speed at the bottom of the chamber and lighter laminae move transversely and pass through the remainder of said discharge openings where air speeds are lower,

a vertically extending air passage connected to and receiving air only from said lowermost discharge opening for further separating laminae and stems that were swept into the lowermost discharge opening,

a single outlet passage connected to said vertical extending air passage and to said remainder of the discharge openings for combining all the laminae separated from the stems into a single output air stream, and

means at the bottom of the vertically extending air passage for removing stems swept into the lowermost discharge opening of the separation chamber.

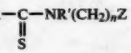
4,618,416

THIOAMIDES, THEIR PREPARATION AND USES

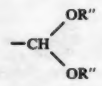
Guy Levesque, Contest, and Pierre Tozzolino, Serres-Morlaas, both of France, assignors to Societe Nationale Elf Aquitaine (Production), France

Continuation-in-part of Ser. No. 632,630, Jul. 19, 1984, abandoned. This application Oct. 15, 1985, Ser. No. 787,449
Claims priority, application France, Jul. 19, 1983, 83 11880
Int. Cl.[4] B03D *1/14*
U.S. Cl. 209—166 **12 Claims**

1. Process of froth flotation of metal sulfide minerals in which a thioamide is employed as the collector and the metal sulfide is recovered from the froth, wherein the thioamide is of the formula



R designating C_5 to C_{17} alkyls, R′ being H or $(CH_2)_nOR''$ and n an integer of 1 to 6, while Z is —OR″ or

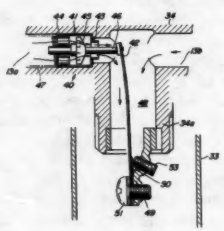


where R″ means H, CH_3 or C_2H_5.

4,618,417
FUEL FILTER FOR DIESEL ENGINE

Katsuto Yamanouchi; Katsuo Saitoh, both of Yokohama; Yoshinori Saito, and Tadashi Kikyohara, both of Atsugi, all of Japan, assignors to Nissan Motor Co., Ltd. and Atsugi Motor Parts Co., Ltd., both of, Japan

Filed Jan. 31, 1985, Ser. No. 696,912
Claims priority, application Japan, Feb. 4, 1984, 59-17659
Int. Cl.[4] B01D *27/10*
U.S. Cl. 210—149 **13 Claims**



1. A fuel filter for use in a diesel engine having a fuel injection pump, said fuel filter comprising;

a fuel filter body having a center tube, an inlet port to receive fuel from a fuel tank and connected to supply such fuel to said center tube, and an outlet port to supply filtered fuel to said fuel injection pump;

a filter element located coaxially of said center tube through which fuel received from said center tube is filtered before being supplied through said outlet port to the fuel injection pump;

means on said filter body defining a fuel introduction port to receive a part of warmed fuel overflowing from the fuel injection pump and connected to supply said warmed fuel to said center tube to be mixed with fuel supplied from said tank;

a check valve disposed in said fuel introduction port and operable to allow said warmed fuel to flow therethrough; and

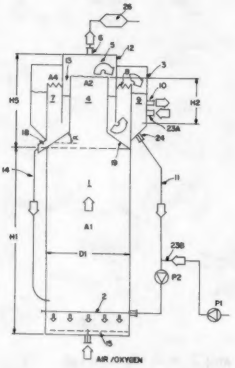
a bimetal element operatively connected to said check valve and mounted on said filter body to sense temperature of fuel flowing through the center tube to cause said check valve to open in response to a predetermined temperature thereof and adjust the proportion of the warmed fuel supplied to the center tube for filtering by the filter element.

4,618,418
FLUIDIZED BED REACTOR

Joseph J. Heijnen, Rijen; Pieter A. Lourens, and Albertus J. Vixseboxse, both of Delft, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Continuation of Ser. No. 479,200, Mar. 28, 1983, abandoned. This application Dec. 26, 1984, Ser. No. 685,220
Claims priority, application Netherlands, Mar. 29, 1982, 8201293
Int. Cl.[4] C02F *3/28*
U.S. Cl. 210—151 **20 Claims**

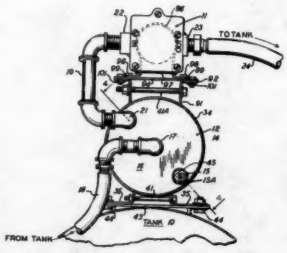
1. A single unit fluidized-bed reactor for purification of waste water with biomass attached to carrier particles, comprising a reaction space equipped with a liquid distribution device above the bottom of the reaction space particularly suited for introduction of waste water in wide reactors to achieve uniform fluidization therein, said device consisting of a number of substantially horizontal pipes, each having in the under-surface a number of regularly distributed openings for downward introduction of a liquid, and on top of the reaction space united therewith a multifunctional three phase separator for complete separation of a gas-liquid-solids mixture leaving the reaction space, said three phase separator comprises a space for collection and accumulation of gas remaining or formed during biological waste water treatment provided with a gas outlet, and a liquid-solid separation compartment positioned and arranged to act on the liquid-solids mixture and provided with means to remove at least a part of the purified liquid and with means for complete return of the carrier particles overgrown with biomass into the reaction space by gravity, the gas oulet is provided with a means for increasing gas pressure in the gas collection and accumulation space, the three phase separator being construction and arranged so as to act on treatments involving large or small gas fractions in the reactor.



4,618,419
LIQUID STORAGE TANK MOISTURE FILTER

Clive Hollinshead, 29572 Spotted Bull La., San Juan Capistrano, Calif. 92675, and Marion A. Willbanks, P.O. Box 1154, National City, Calif. 92050

Filed Jul. 19, 1984, Ser. No. 632,378
Int. Cl.[4] B01D *35/00*
U.S. Cl. 210—167 **3 Claims**



1. In a liquid fuel system having a fuel tank with connections to a fuel pump and a fuel consuming device and to a fuel filter having input and output ports the combination comprising fuel tank having first and second ends; a fuel filter; a recirculation filter pump;

a first fuel line operatively connected from said first fuel tank end, to a port of said fuel filter, a second fuel line operatively connected between said recirculating pump and said second fuel tank end, a third line connecting said recirculating pump to said fuel filter; said fuel filter comprising

a cannister with opposed ends, a paper filter core having a

hollow center, obverse and reverse cannister end caps, input and output ports in said reverse cannister end cap, a collector volume between said paper core and the reverse end cap inner wall, said output port opening into said volume;

a fluid entry tube connecting to said input port and extending through said hollow center of said paper core, walls defining a manifold cavity between said paper core and said obverse cap inner wall, said entry tube entering said cavity; a restrictive outlet from said entry tube being the only communication through said manifold cavity to said paper core;

a seal between the cavity and the paper core hollow center;

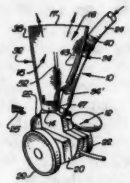
and means removably securing said obverse cap to said cannister end.

4,618,420

FILTER BAG FOR POOL CLEANERS

J. Jesus Alanis, San Marcos, Calif., assignor to Alopex Industries, Inc., San Marcos, Calif.

Filed Nov. 5, 1984, Ser. No. 668,487
Int. Cl.[4] B01D *35/16*
U.S. Cl. 210—169 **19 Claims**



1. A filter bag for use with a pool cleaner having a suction mast for flow of water and debris drawn from a swimming pool or the like, said bag comprising:

a pair of sidewalls of generally common shape and formed from a material pervious to water flow and generally impervious to passage of debris therethrough, said sidewalls being joined together by a seamless upper end and having generally aligned front margins and rear margins;

means for interconnecting said sidewalls along said front margins and along said rear margins, said interconnecting means being releasably separable over at least a portion of said rear margins to define a debris discharge opening;

a mounting collar carried by said sidewalls generally at the lower ends thereof and generally adjacent said front margins for mounting said bag onto the discharge end of the pool cleaner suction mast, said mounting collar cooperating with said sidewalls to define an open mouth for passage of water and debris drawn through the suction mast into the bag interior between said sidewalls; and

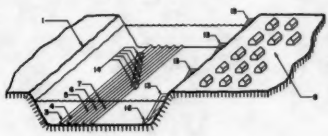
means for dividing the bag interior into a primary flow chamber disposed generally adjacent said front margins in flow communication with the open mouth defined by said collar and a collection chamber disposed generally adjacent said rear margins and having a lower end blocked from direct flow communication with the open mouth and an upper end in flow communication with the primary flow chamber, said divider means comprising a divider seam interconnecting said sidewalls and extending generally upwardly from the side of said mounting collar opposite said front margins and terminating in spaced relation below said seamless upper end, whereby water flowing through the open mouth passes through the primary flow chamber and exits the bag generally through the seamless upper end and debris flowing through the open mouth passes through the primary flow chamber and settles within the collection chamber.

4,618,421

FLUID TRANSPORT AND PROCESSING SYSTEM

Frederick W. Kantor, 523 W. 112th St., New York, N.Y. 10025

Filed Sep. 27, 1982, Ser. No. 423,522
Int. Cl.[4] C02C *1/02*
U.S. Cl. 210—170 **7 Claims**



1. A liquid transport system for disposing of liquid waste from the land adjacent an inland water artery having a naturally sloping bed, said system comprising at least one flexible wall main conduit beneath the surface of the artery and extending in the direction of water flow along said artery, the liquid waste inside said conduit being in fluid equilibrium with the fluid outside; a plurality of liquid inlet conduits for conveying liquids into said main conduit from positions spaced along said artery, said artery emptying into a larger body of water, merge means for coupling said inlet conduits with said main conduit for feeding said liquid wastes into said main conduit at a plurality of locations therealong; pump means for safely augmenting the flow of liquid waste in said main conduit towards said larger body of water said pump means including flow augmentation means within said main conduit to augment safely the flow of said liquid wastes in one direction along through said main conduit without causing substantial departure from said pressure equilibrium for achieving dynamic stability of the flow of said liquid wastes through said conduit, and said flow augmentation means including means permitting flow of said liquid wastes therepast in the event of operating failures of said flow augmentation means; and disposal means located in said larger body of water for receiving and disposing of the liquid waste from said main conduit: the disposal means including a submerged processing plant submerged beneath the surface of said body of water and having means for carrying out treatment of said liquid wastes while said wastes are at fluid equilibrium with the larger water body and having an inlet thereof connected to an outlet of said main conduit.

4,618,422

FILTER DEVICE FOR A FUEL TANK

Michiaki Sasaki, Hadano, and Akira Mizusawa, Fujisawa, both of Japan, assignors to Nissan Motor Company, Limited and NIFCO Incorporated, both of, Japan

Continuation of Ser. No. 598,679, Apr. 10, 1984, abandoned. This application Aug. 27, 1985, Ser. No. 769,803
Claims priority, application Japan, Apr. 25, 1983, 58-72394
Int. Cl.[4] B01D *29/10, 35/02*
U.S. Cl. 210—172 **20 Claims**

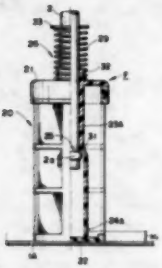
1. A filter for use in a fuel tank, said fuel tank being provided with a suction pipe mounted substantially vertically with a first intake opening formed at the tip of a lower portion and spaced a first distance from the bottom wall of the tank, said filter comprising:

a filter body having an upper wall and a lower wall;

a tubular guide portion extending axially from said upper wall through the filter body toward said lower wall and having a second intake opening near the lower wall of the filter body;

said tubular guide portion including a first section supported for sliding movement on the lower portion of said suction pipe and a second section of said guide portion extending beyond the tip of the suction pipe substantially the entire said first distance to the bottom wall of the tank, said second intake opening being spaced a second distance less than said first distance from the bottom wall of the tank,

and said filter body, including said guide portion, being slidable along said suction pipe to prevent damage to the filter in the event the bottom wall of the tank is collapsed inwardly for a portion of said first distance;



spring means extending between the suction pipe and the filter body for biasing the filter body toward the bottom wall of the tank; and

retaining means provided at said lower portion of the suction pipe for retaining said guide portion and for preventing the suction pipe from slipping out of the filter body.

4,618,423

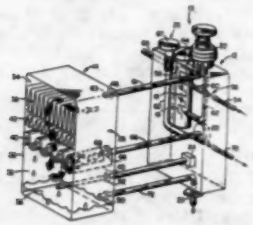
DISPOSABLE FUEL FILTER/WATER SEPARATOR ELEMENT

David Hodgkins, Manchester, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Division of Ser. No. 507,799, Jun. 24, 1983, Pat. No. 4,491,120. This application Dec. 27, 1984, Ser. No. 696,643

Int. Cl.⁴ B01D 29/06

U.S. Cl. 210—305 **8 Claims**



1. A disposable fuel filter/water separator element comprising a housing having a filter chamber including an upper portion and a lower portion, said lower portion defining a sump, a fuel inlet port communicating with an upper portion of said filter chamber, a fuel outlet port communicating with said lower portion of said filter chamber, a filter assembly disposed within said filter chamber and extending thereacross, said filter assembly separating said upper portion from said lower portion and including a plurality of elements arranged in vertical series and through which fuel flow from said fuel inlet port to said fluid outlet port is constrained to pass, said elements including a primary filter element and a coalescing element, said primary filter element being located between said coalescing element and said upper portion, an inverted generally U-shaped liquid impervious baffle disposed within said lower portion and defining a fluid outlet region of said filter chamber, said fuel outlet port communicating with said lower portion of said filter chamber within said fluid outlet region, said coalescing element and said baffle cooperating to define the upper extent of said lower portion.

4,618,424

ROTARY VACUUM FILTER WITH ADJUSTABLE IMMERSION ANGLE

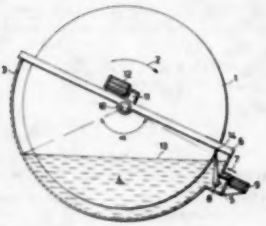
Ingvar Lundin, Stora Herrestad 75:2, 271 00 Ystad, Sweden

Filed Jun. 23, 1983, Ser. No. 506,996

Claims prior'ty, application Sweden, Jul. 7, 1982, 8204212

Int. Cl.⁴ B01D 33/06

U.S. Cl. 210—396 **4 Claims**



1. Rotary vacuum filter for filtering a suspension of yeast or any other plant cell material, comprising a drum (1), a trough (3) for the suspension positioned under the drum, and a doctor knife (5) for removing a filter cake produced during the filtration, wherein the doctor knife is attached to said trough adjacent to one of the upper edges (6) of the trough, and wherein an axle (10), which coincides with the geometric axis of the drum (1), is provided for and supports the trough which is mounted so as to be rotatable around the axle (10), whereby the immersion angle (α) is infinitely adjustable by said rotation, and so that the doctor knife (5) can be moved towards and away from the center of the drum (1).

4,618,425

PUMP FOR PUMPING CORROSIVE FLUIDS

Martyn R. G. Yates, Surrey, United Kingdom, assignor to Production Techniques Limited, Hampshire, England

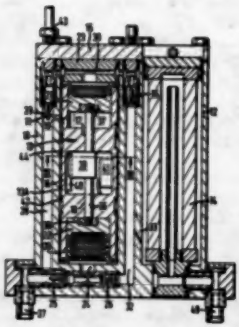
PCT No. PCT/GB84/00153, § 371 Date Dec. 17, 1984, § 102(e) Date Dec. 17, 1984, PCT Pub. No. WO84/04363, PCT Pub. Date Nov. 8, 1984

PCT Filed May 4, 1984, Ser. No. 684,928

Claims priority, application United Kingdom, May 4, 1983, 8312122

Int. Cl.⁴ B01D 29/42

U.S. Cl. 210—416.1 **9 Claims**



1. A submersible pump for pumping corrosive fluids which comprises one group of parts which collectively comprise all the parts of the pump that are wetted by corrosive fluids during use of the pump, all the parts of said one group being formed of a material which is resistant to corrosion by corro-

sive fluid which the pump is designed to pump and including corrosive fluid displacement means operable to cause flow of corrosive fluid, said pump having a complete outer casing and motive power supply means connectable to an external source of motive power; and another group of parts which is wholly encased within structure which is formed by said one group of parts and thereby is shielded from contact by corrosive fluid which is pumped by the pump, and which includes power operable motive means operable to drive the corrosive fluid displacement means, characterized in that said pump is gas driven reciprocatory double acting bellows pump, the bellows of which bound respective working fluid spaces of said power operable motive means and function as said corrosive fluid displacement means, and said motive power supply means comprise gas supply conduit means for supplying working gas from a remote source of such gas under pressure through said structure to either working fluid space, there being exhaust gas conduit means provided for exhausting working gas from the other working fluid space and for conveying exhausted working gas through said structure and away to a remote location during operation of the pump.

4,618,426

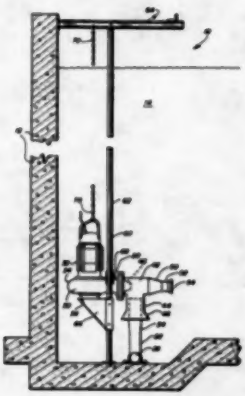
RETRIEVABLE JET MIXING SYSTEMS

Mikkel G. Mandt, 2309 Grand Blvd., Cedar Falls, Iowa 50613

Continuation of Ser. No. 565,021, Dec. 22, 1983, abandoned. This application Aug. 2, 1985, Ser. No. 762,038

Int. Cl.[4] C02F 3/02

U.S. Cl. 210—620 **14 Claims**



11. A method for retrievably assembling a wastewater aeration system comprising the steps of providing a pressurized air source having an upstanding discharge pipe at a predetermined location within a wastewater treatment basis below the level of wastewater to be aerated therein, providing guide and support means for guiding a retrievable jet aerator assembly into a predetermined position within the wastewater treatment basis for supporting the jet aerator assembly in jet aeration operation at said predetermined position and for permitting withdrawl of the jet aerator assembly from the reservoir for servicing, retrievably positioning on said guide and support means a jet aerator assembly having a downwardly directed secondary fluid inlet conduit such that the conduit is telescopically disengageably positioned at said predetermined position over the discharge orifice of the gas discharge pipe to provide a hydrostatic head of at least about 1 inch of water between the lowest elevation of the discharge pipe orifice and the highest elevation of the secondary fluid inlet orifice providing at least one primary motive stream of liquid wastewater from within the wastewater treatment basin, combining said at least one primary motive stream in a jet mixing nozzles of said jet aerator assembly with secondary fluid from said secondary fluid inlet conduit, said secondary fluid comprising air discharge from said pressurized air source through said upstanding discharge pipe, and discharging the combined primary motive stream and secondary fluid into the waste water treatment basin below the level of wastewater to be aerated therein.

4,618,427

METHOD OF TREATING AND BREAKING UP A LIQUID WITH THE HELP OF CENTRIPETAL FORCE

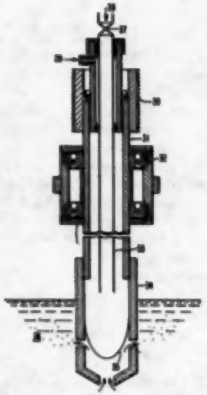
Karl Venås, Saupstad, Norway, assignor to Ardal og Sundal Verk a.s., Norway

Filed Jan. 23, 1985, Ser. No. 694,116

Claims priority, application Norway, Jan. 25, 1984, 840272

Int. Cl.[4] C02F 3/02; C21C 7/00

U.S. Cl. 210—629 **18 Claims**



1. A method of treating a liquid which is caused to rotate inside a hollow cylindrical body having a smooth outer vertical surface thereof with at least one inlet hole at the bottom of the hollow cylindrical body and a plurality of outlet holes in said outer vertical surface spaced from the bottom of the hollow body, the cylindrical hollow body being attached to a vertical hollow shaft in fluid communication with the hollow cylindrical body and the hollow cylindrical body being at least partly submerged in a liquid with the outlet holes below the level of liquid, comprising:

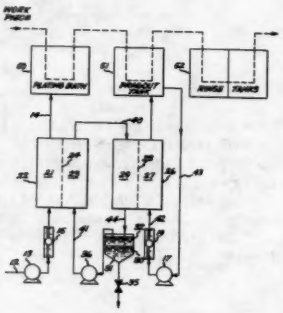
rotating said hollow cylindrical body in the liquid with said outlet holes in said smooth outer vertical surface below the upper surface of said liquid to cause liquid to pass through said at least one inlet hole and rotate inside said hollow cylindrical body forming a parabolic liquid surface within said hollow cylindrical body, the lowermost level of said parabolic liquid surface being below said outlet holes and the uppermost level of said parabolic liquid being above said outlet holes; and

passing gas into said hollow cylindrical body for intermixing with said liquid below said parabolic liquid surface, which together are ejected out said outlet holes into the surrounding liquid, whereby the liquid is treated with gas solely by rotation of said cylindrical hollow body having a smooth outer vertical surface.

4,618,428
PROCESS FOR RECOVERY OF ZINC FROM PLATING WASTE SOLUTIONS

Bang M. Kim, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 13, 1982, Ser. No. 407,961
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—648 **10 Claims**

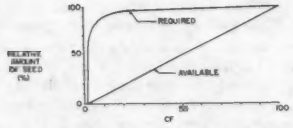


1. A method for recovery of zinc from an aqueous zinc containing solution, said method comprising the steps of:
contacting the aqueous zinc containing solution with a first side of a first membrane;
contacting the second side of said first membrane with an organic zinc-selective solvent for the selective passage of zinc through said first membrane;
contacting the first side of a second membrane with a solvent which has been in contact with said first membrane;
removing aqueous solution from said solvent;
contacting the second side of said first membrane with the solvent which has been in contact with the first side of said second membrane; and
contacting the second side of said second membrane with a stripping solution for the selective passage of zinc through said second membrane.

4,618,429
METHOD OF MAINTAINING ADEQUATE SEED CRYSTAL IN PREFERENTIAL PRECIPITATION SYSTEMS

Howard R. Herrigel, Seattle, Wash., assignor to Resources Conservation Co., Bellevue, Wash.

Continuation-in-part of Ser. No. 678,900, Dec. 6, 1984. This application Dec. 14, 1984, Ser. No. 682,441
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—652 **24 Claims**



1. In a method comprising, maintaining an adequate amount of seed crystal required to inhibit scaling and fouling in solution concentration systems employing preferential precipitation and concentrating solutions at an initial concentration factor between 1 and 2, which said concentration factor increases during successive concentration steps, said method comprising substantially precluding seed crystal deficiency in the system, and thereby scaling, when the concentration factor is less than about 2, and substantially precluding overloading of the system with seed crystals, and thereby minimizing pumping problems, when the concentration factor is at least about 2, by:
(a) determining the minimum amount of seed crystal necessary to prevent scaling for the particular solution being concentrated at a relatively high concentration factor, C.F.$_{MAX}$, of about 10 or greater;
(b) providing a percentage multiplier determined as follows:

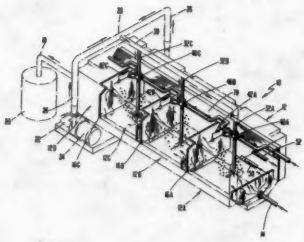
$$\% \text{ multiplier} = 25 \times (\text{C.F.}) \times [\text{C.F.}_{MAX}/(\text{C.F.}_{MAX} - 1)]$$

wherein C.F. is the concentration factor at which the feed solution will initially be concentrated, and wherein C.F.$_{MAX}$ is some relatively high concentration factor of about 10 or greater, which said percentage multiplier is multiplied by the amount determined in step (a) above to determine an amount to be introduced to the feed solution; and
(c) introducing to the feed solution the amount determined in step (b) above.

4,618,430
PROCESS AND APPARATUS FOR REMOVING SCUM FROM A LIQUID SURFACE

Uncas B. Favret, Jr., Covington, and Phil J. Duhon, Abbeville, both of La., assignors to Engineering Specialties, Inc., Covington, La.

Filed Nov. 6, 1984, Ser. No. 668,833
Int. Cl.[4] C02F *1/24*
U.S. Cl. 210—703 **17 Claims**



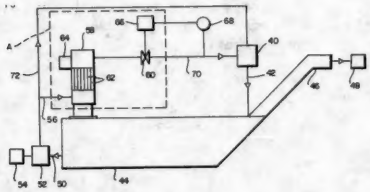
1. An apparatus for removing waste matter contained in a liquid, comprising:
a cell for receiving waste-containing liquid;
means for introducing gas into the waste-containing liquid in said cell to float waste matter to the liquid surface in the form of a floating scum;
a waste outlet disposed adjacent at least one edge of the liquid surface,
means for displacing scum into said waste outlet comprising gas nozzle means situated adjacent the liquid surface and oriented to eject streams of pressurized gas across the liquid surface to blow scum into said waste outlet, and means for supplying pressurized gas to said nozzles at a pressure sufficient to blow the scum into said waste outlet.

12. A process for removing waste from a liquid, comprising the steps of:
locating the liquid in a cell;
introducing gas into the liquid to float waste matter to the liquid surface to form a floating scum thereon; and
ejecting a stream of pressurized gas across the liquid surface from a nozzle located adjacent the water surface and directed toward a waste outlet disposed along a side of said cell, to displace the scum into said waste outlet.

4,618,431
METHOD FOR STABILIZING THE RELATIONSHIP BETWEEN THE FILTERING UNIT AND A FILTER FEED PUMP

David B. Hindman; James S. Paduchowski, and Joseph D. Lima, all of Rochester, N.Y., assignors to French Systems, Inc., Rochester, N.Y.

Filed Jan. 8, 1985, Ser. No. 689,818
Int. Cl.[4] B01D *37/04*
U.S. Cl. 210—741 20 Claims



1. A method of reducing the effects of fluctuating fluid pressure differential between the inlet and outlet of a filtering unit operating in a system for filtering metal contaminants from a lubricating coolant and for recycling a constant volume flow of filtered lubricating coolant to a workpiece to be machined, including the steps of:

(a) providing a holding vessel for receiving metal-contaminated lubricating coolant,

(b) collecting said metal-contaminated lubricating coolant in said holding vessel,

(c) providing pumping means for pumping said contaminated lubricating coolant from said holdng vessel,

(d) providing a filtering unit-modulator valve combination downstream of said pumping means, said combination including a filtering unit associated with a modulator valve, and having an outlet connected directly to a workpiece to be machined,

(e) operating said pumping means to pump said metal-contaminatcd lubricating coolant at a pressure above atmospheric pressure from said holding vessel to said filtering unit-modulator valve combination,

(f) filtering metal contaminants from said lubricating coolant in said filter unit,

(g) monitoring the flow of filtered lubricating coolant at said outlet of said filter unit-modular valve combination, and

(h) operating said modulator valve in response to any changes in the flow rate or pressure of said lubricating coolant at said outlet, thereby maintaining a predetermined constant fluid pressure differential across said filtering unit-modulator valve combination thus compensating for fluctuations across said filtering unit due to build-up of contaminants at the filter surface and further resulting in the maintenance of constant head pressure at the outlet of said pumping means and the maintenance of a constant flow rate and pressure of filtered lubicating coolant to the workpiece to be machined.

8. A lubricating coolant filtering and recycling system comprising:

(a) a holding vessel for receiving and collecting metal-contaminated lubricating coolant from a machining station,

(b) pumping means positioned downstream of said holding vessel,

(c) a filtering unit-modulator valve combination comprising a modulator valve connected to a filtering unit, positioned downstream of said pumping means, and having an outlet connected directly to said machining station,

(d) said pumping means being operative to pump coolant from said holding vessel to said filtering unit-modulator valve combination against a head pressure above atmospheric pressure,

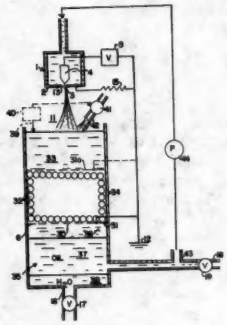
(e) monitoring means for monitoring the flow of filtered lubicating coolant downstream of said filtering unit-modulator valve combination adjacent the outlet thereof, and

(f) modulator valve operation control means for controlling the operation of said modulator valve in response to any changes in the pressure or flow rate of said coolant downstream of said filtering unit-modulator valve combination as monitored at the outlet thereof by said monitoring means, wherein operation of said modulator valve functions to restore the fluid pressure differential across the filtering unit-modulator valve combination to a predetermined value selected according to system operating parameters in response to fluctuations in fluid pressure differential across the filtering unit due to accumulation of metal contaminants in the filtering unit, and thereby to maintain said head pressure constant.

4,618,432
METHOD AND APPARATUS FOR CHARGING A CONTAMINANT-LADEN LIQUID

Donald J. Mintz, Summit, and Anthony M. Gleason, Westfield, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Apr. 17, 1984, Ser. No. 601,274
Int. Cl.[4] B01D *17/06;* B03C *5/00, 5/02*
U.S. Cl. 210—748 25 Claims



1. A method of charging a dispersed contaminant phase in a continuous liquid phase, comprising the steps of:

(1) introducing a net unipolar charge into a further liquid that is substantially free of any dispersed contaminant phase; and

(2) causing the dispersed contaminant phase to become charged by bringing the contaminated and substantially contaminant-free liquids into contact with one another and allowing charge from the substantially contaminant-free liquid to be volumetrically distributed through the continuous liquid phase of the contaminated liquid to the dispersed contaminant phase.

4,618,433
DRILLING FLUIDS AND THINNERS THEREFOR

George M. Allison, III, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 30, 1984, Ser. No. 636,054
Int. Cl.[4] C09K *7/02*
U.S. Cl. 252—8.514 17 Claims

1. An aqueous drilling fluid comprising water, finely divided solids and a first agent comprising a sulfoalkylated tannin containing no complexing heavy metal and a second agent comprising at least one at least partly water-soluble metal compound comprising tin, wherein the weight ratio of said first agent to said second agent is in the range from about 100:1 to about 1:1.

4,618,434
DRILLING FLUIDS MADE FROM SOLID, FREE-FLOWING, CONTINUOUSLY-MADE, WATER DISPERSIBLE PVA-ALDEHYDE REACTION PRODUCT

John J. Blouin, Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 553,510, Nov. 21, 1983, Pat. No. 4,472,552, which is a continuation-in-part of Ser. No. 423,798, Sep. 27, 1982, abandoned. This application Mar. 21, 1984, Ser. No. 591,833

Int. Cl.[4] C09K *7/02*

U.S. Cl. 252—8.51 **6 Claims**

1. In a water based drilling fluid suitable for circulating in a bore hole while drilling the bore hole into subterranean formations which include water, a weighting agent and a fluid-loss controller, the improvement which comprises that said fluid loss controlling agent is the product made by the process comprising

(a) adding to a rotating continuous reactor to form a mixture
(i) solid particles of polyvinyl alcohol,
(ii) an aldehyde, and
(iii) an aqueous salt solution adjusted to have an acidic pH;
(b) mixing the mixture of step (a) in the reactor until a polyvinyl alcohol-aldehyde reaction product is obtained; and
(c) drying the polyvinyl-aldehyde material, said product being present in said fluid in from about 0.1 to 15 percent by weight based on the weight of the water present in said fluid and said fluid is maintained at a pH of from 8 to 12.

4,618,435
ORGANIC TITANIUM COMPOSITIONS FOR USE IN OIL AND GAS WELLS

Donald E. Putzig, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 540,721, Oct. 11, 1983, abandoned. This application Jan. 27, 1986, Ser. No. 823,122

Int. Cl.[4] C09K *7/02*

U.S. Cl. 252—8.551 **11 Claims**

1. A composition comprising a dry, water soluble, solid mixture of

(a) the reaction product of a titanate represented by the formula

$(R^1O)_4Ti$

with (i) an amino alcohol represented by the formula

$H_gN(R^2OH)_k$

at a titanate:amino alcohol mol ratio of about 1:1, or (ii) an amino alcohol represented by the formula

$R^3[N(R^4OH)_mR_n^5]_2$

at a titanate:amino alcohol mol ratio in the range between about 1:1 and about 2:1, and

(b) an additive, in an amount sufficient to enhance the uniform crosslinking capacity of said reaction product, which additive is a monosaccharide, a disaccharide, or a polyhydric alcohol which can be obtained by reduction of a monosaccharide,

wherein

R^1 is alkyl containing 1–6 carbon atoms;

each of R^2, R^3 and R^4 is alkylene containing 1–6 carbon atoms;

R^5 is H or alkyl containing 1–6 carbon atoms;

k is 1–3 and g plus k equals 3; and

m is 1 or 2 and m plus n equals 2.

4,618,436
MULTIFUNCTIONAL LUBRICANT ADDITIVES AND COMPOSITIONS THEREOF

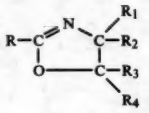
Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 1, 1985, Ser. No. 750,197

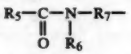
Int. Cl.[4] C10M *129/00, 137/00, 139/00*

U.S. Cl. 252—325 **27 Claims**

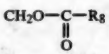
1. A composition comprising a major proportion of an oil of lubricating viscosity or grease prepared therefrom and a minor antiwear or friction reducing proportion of a borated oxazoline derived internal acid phosphate prepared by reacting a hydroxyalkyl hydrocarbyl oxazoline having the following generalized structure with phosphorus pentoxide



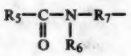
wherein R is from about C_8 to about C_{30} hydrocarbyl or



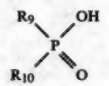
or mixtures thereof and at least one of R_1, R_2, R_3 or R_4 is hydroxyalkyl having from 1 to about 6 carbon atoms and the remaining R_1, R_2, R_3 and R_4 are independently selected from the group consisting of C_1 to about C_{30} hydrocarbyl, C_1 to about C_6 hydroxyalkyl, hydrogen or



where R_8 is hydrogen or C_1 to about C_{30} hydrocarbyl, or



or mixtures thereof and wherein R_5 is from about C_8 to about C_{30} hydrocarbyl, R_6 is from about C_1 to about C_6 hydrocarbyl and R_7 is from about C_1 to about C_3 hydrocarbylene, obtaining the corresponding oxazoline-derived internal acid phosphate having the generalized structure



wherein at least one of R_9 and R_{10} has an oxazoline moiety as described herein and the other R_9 or R_{10} is hydroxyl or C_2 to about C_8 hydrocarbyl, and thereafter borating said oxazoline acid phosphate with a suitable borating agent.

4,618,437
MULTIFUNCTIONAL FRICTION-MODIFYING ADDITIVES AND COMPOSITIONS THEREOF

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Company, New York, N.Y.

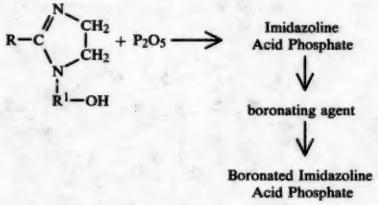
Filed Jul. 1, 1985, Ser. No. 750,195

Int. Cl.[4] C10M *129/00, 137/00, 139/00*

U.S. Cl. 252—32.5 **25 Claims**

1. A composition comprising a major proportion of an oil of lubricating viscosity or grease prepared therefrom and a minor friction reducing or antiwear proportion of a boronated imid-

azoline derived internal acid phosphate prepared by reacting a hydrocarbyl imidazoline in the following generalized reaction with phosphorus pentoxide, followed by reaction with a boronating agent



where

R is about C_6 to about C_{30} hydrocarbyl or hydrocarbyl substituted with oxygen, sulfur and/or nitrogen and

R^1 is C_1 to about C_6 hydrocarbylene.

4,618,438

POLYMERIC THIADIAZOLE LUBRICANT ADDITIVE

Sameeh S. Toukan, Chester, and James P. King, Lansdale, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 3, 1985, Ser. No. 719,596

Int. Cl.[4] C10M *1/38*

U.S. Cl. 252—47.5 **23 Claims**

1. An oil soluble lubricant additive composition comprising a reaction product of:

(a) a polymer of 3,5-dimercapto-1,2,4-thiadiazole; and

(b) a polyalkylene succinimide having an alkenyl group of about 50 to 100 carbon atoms.

4,618,439

MULTIFUNCTIONAL ADDITIVE FOR LUBRIFICATING OILS AND PROCESS FOR THE PREPARATION THEREOF

Gabriella Brandi, S. Donato Milanese; Paolo Koch, Melegnano; Stefano Maiorana; Piero Dalla Croce, both of Milan, and Clara Baldoli, Vimodrone, all of Italy, assignors to AGIP Petroli S.p.A. and Consiglio Nazionale Delle Ricerche, both of Rome, Italy

Filed Jun. 10, 1985, Ser. No. 742,735

Claims priority, application Italy, Jun. 15, 1984, 21428 A/84

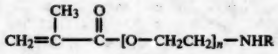
Int. Cl.[4] C10M *145/14*

U.S. Cl. 252—47.5 **14 Claims**

1. Multifunctional additive for lubricating oils, constituted by a graft copolymer, with weight average molecular weight of from about 50,000 to about 600,000, consisting of a base copolymer and of an amount of grafted monomers of from 1 to 20 parts by weight per each 100 parts by weight of base copolymer:

said base copolymer being the product of the copolymerization of an alkyl metacrylate, containing from 1 to 4 carbon atoms in the alkyl radical, with an alkyl metacrylate containing from 10 to 18 carbon atoms in its alkyl radical, in such a ratio to each other that the average number of carbon atoms of the alkyl is of from 11 to 15,

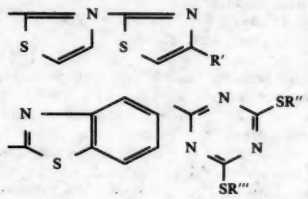
said grafted monomers comprising at least a member selected from the class consisting of (a): N-vinylimidazoles, N-vinylpyrrolidones, vinylpyridines and N,N-dialkylaminoethyl-metacrylates; and at least a member selected from the class of compounds definable by means of the general formula (b):



wherein:

n is 0 or 1;

R is a group selected from:



R′, R″ and R‴ being alkyl groups containing from 1 to 18 carbon atoms.

4,618,440

SUBSTITUTED 4-HYDROXYBENZYLTHIO ALDEHYDE AND KETONE STABILIZERS

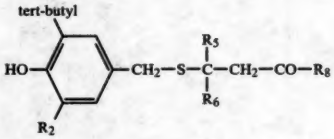
David H. Steinberg, New York; John J. Luzzi, Carmel, and Frank P. Cortolano, Valhalla, all of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 743,224, Jun. 10, 1985, abandoned, which is a continuation of Ser. No. 544,297, Oct. 21, 1983, abandoned. This application Jan. 2, 1986, Ser. No. 815,772

Int. Cl.[4] C07C *149/273;* **C08K** *5/37*

U.S. Cl. 252—48.2 **10 Claims**

1. A compound of the formula



Wherein

R_2 is methyl or tert-butyl,

R_5 is hydrogen or methyl,

R_6 is hydrogen, alkyl of 1 to 3 carbon atoms or phenyl, and

R_8 is hydrogen or methyl.

10. A composition of matter comprising a lubricating oil subject to oxidative, thermal and actinic degradation stabilized with an effective stabilizing amount of a compound of claim 1.

4,618,441

METALWORKING WITH A LUBRICANT COMPOSITION COMPRISING MINERAL OIL AND ALKOXYALKYL ESTER

Mei-Yuan Tsai, Murrysville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 23, 1984, Ser. No. 674,287

Int. Cl.[4] C10M *173/00, 129/70*

U.S. Cl. 252—49.5 **20 Claims**

1. A method of metalworking comprising the steps of

(a) applying to a metal object a lubricant composition comprising

(1) about 50–95 wt % mineral oil, and

(2) about 5–50 wt of an alkoxyalkyl ester having the formula $R_2COO(CH_2CH_2O)_nR_1$ wherein n=1 or 2, R_1 is a C_1 to C_8 alkyl group and R_2 is a C_7 to C_{19} alkyl or alkenyl group, and

(b) performing a metalworking operation on the metal object.

4,618,442
PLANT CRYOPROTECTION

Robert J. Geary, and Robert J. Geary, III, both of 6655-53rd St., Vero Beach, Fla. 32960

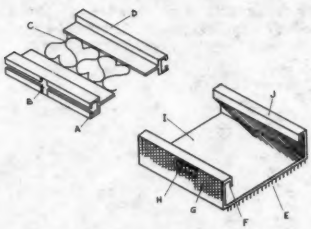
Filed Oct. 7, 1985, Ser. No. 784,935
Int. Cl.[4] C09K 3/18
U.S. Cl. 252—70 11 Claims

1. A method of increasing the resistance of plants to damage by freezing conditions comprising applying to the plant surfaces at ambient non-freezing temperatures about 0.25 to about 9 days prior to exposure to such conditions an aqueous solution containing, approximately by weight and as an essential active cryoprotectant component, 0.1% to 2.5% of a water soluble nonionic surface active polyethoxylated polyoxypropylene block copolymer having a molecular weight of about 2,000 to about 7,000 and a molar ratio of propylene oxide:ethylene oxide of about 2.5:1 to about 0.7:1.

4,618,443
EASY GRIP EASY SCRUB SOAP BAR-SCRUB BRUSH COMBINATION

John L. Jude, 200 Edgewater Dr., Coral Gables, Fla. 33133

Filed Sep. 12, 1985, Ser. No. 775,375
Int. Cl.[4] A47K 7/03; C11D 17/04
U.S. Cl. 252—92 17 Claims



1. A combination soap bar and scrub brush comprising:

(A) A soap bar having an insert providing channels on opposite surfaces of said bar for releasably engaging a scrubbing implement, said channels being connected to each other by means extending through the center of said bar and

(B) A scrubbing implement having means attached thereto for engaging with the channels of the soap bar insert, said scrubbing implement being capable of being removed from the channels and reinserted in inverted position so as to permit utilization of substantially the entire soap bar, said scrubbing implement being releasably engaged with the channels of said insert.

4,618,444
HOUSEHOLD LAUNDRY DETERGENT WITH DUAL STRENGTH BLEACH

John O. Hudson, Garden Grove; Mickey M. Schleien, Culver City, and John Barrett, La Mirada, all of Calif., assignors to Purex Corporation, Lakewood, Calif.

Filed Sep. 17, 1984, Ser. No. 651,579
Int. Cl.[4] C11D 17/00; B08D 3/00
U.S. Cl. 252—92 29 Claims

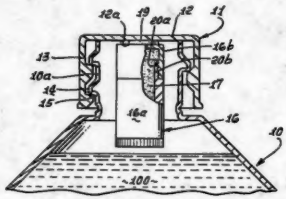
1. A laundry aid package comprising, in combination:

(a) a first openable container containing a bleach base that includes a peroxygen bleaching agent for use in home laundering of fabrics, and a first halide salt or salts,

(b) a dispensing container containing a bleach activator composition including a second halide salt or salts and forming a fitment,

(c) the fitment carried by the first container to be readily detachable at least in part for dispensing the activator composition to controllably activate the bleach forming hypohalites at the time of fabric laundering.

(d) the first container being a bottle having a removable cap, the bottle having a neck and the cap having a top wall and a depending skirt that extends in interfitting threaded relation with said neck, and the fitment being retained by said cap top wall,



(e) the fitment dispensing container cap being presented at the exterior side of the cap top wall for removal to gain access to the dispensing container contents irrespective of whether the bottle cap is on the bottle neck or removed therefrom,

(f) the major portion of said dispensing container and the major portion of the contents thereof being located below the top level of said bottle neck, and extending within said neck but spaced inwardly from the neck.

4,618,445
PEROXIDE BLEACH AND COMPOSITIONS COMPRISING SAID BLEACH

Gulzari L. Madan, Andheri, and Bookinkere C. S. Rao, Mysore, both of India, assignors to Lever Brothers Company, New York, N.Y.

Filed May 21, 1984, Ser. No. 612,504
Claims priority, application United Kingdom, May 20, 1983, 8313941
Int. Cl.[4] C11D 7/18, 7/56
U.S. Cl. 252—99 5 Claims

1. A peroxide bleach comprising an adduct which is a mixed crystal having the formula:

$$4Na_2SO_4.2H_2O_2.NaCl\ (xM_2O.yP_2O_5)_n,$$

wherein M is alkalimetal; x is a number from 1 to 3; y is a number from 0.5 to 2; and n is from 0.1 to 1.

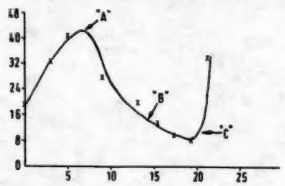
4,618,446
SPHERULITIC LIQUID DETERGENT COMPOSITION

William P. Haslop, Cleator Moor; John M. Allonby; Brian J. Akred, both of Whitehaven, and Edward T. Messenger, Workington, all of England, assignors to Albright & Wilson Limited, Oldbury, England

Continuation-in-part of Ser. No. 576,632, Feb. 3, 1984. This application Dec. 21, 1984, Ser. No. 684,802
Claims priority, application United Kingdom, Dec. 22, 1983, 8334250; Jun. 20, 1984, 8415783; Aug. 28, 1984, 8421759
Int. Cl.[4] C11D 3/14, 3/065, 3/08, 1/18
U.S. Cl. 252—135 20 Claims

1. A Stable, Pourable, fluid, detergent composition consist-

ing essentially of water, about 5% to about 30%, by weight, Active Ingredients and sufficient Electrolyte to form with at



least part of said Active Ingredients a space filling floc of Spherulites.

4,618,447

SURFACTANT-BASED SOLVENT SYSTEM FOR DEWATERING DIFFERENT SUBSTRATES

Stanley S. Seelig, Williamsville, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 674,394, Nov. 23, 1984, abandoned. This application Oct. 29, 1985, Ser. No. 791,147

Int. Cl.[4] C11D *1/34, 1/62*

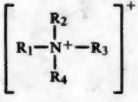
U.S. Cl. 252—139 **37 Claims**

1. A quaternary ammonium salt of a phosphate acid ester of the formula:

$$[A^+]\text{-}[B^-]$$

wherein:

A^+ is a moiety of the formula:



B^- is a moiety of the formula:

n and m are integers from 0 to about 10 provided that n+m is not greater than 10 and further provided that n+m is equal to or greater than 1 when R_5, R_6, R_7 and R_8 are other than aryl, aralkyl or alkylaryl;

R_1 is alkyl having from about 1 to about 2 carbon atoms;

R_2 is alkyl having from about 8 to about 18 carbon atoms;

R_3 is R_1 or R_2;

R_4 is R_1, R_2, aryl, aralkyl or alkaryl and R_5, R_6, R_7 and R_8 are the same or different at each occurrence and are hydrogen alkyl having from about 8 to about 18 carbon atoms, aryl, aralkyl or alkylaryl; with the proviso that at least one of R_4, R_5, R_6, R_7 and R_8 are aryl, aralkyl or alkaryl when n+m is 0, and with the further proviso that at least one of R_5, R_6, R_7 and R_8 other than hydrogen.

4,618,448

CARBOXYLIC/SULFONIC/POLYALKYLENE OXIDE POLYMER FOR USE AS SCALE, CORROSION, AND IRON OXIDE DEPOSIT CONTROL

Charles Y. Cha, McMurray; Richard G. Varsanik, and Shih-Ruey T. Chen, both of Coraopolis, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 669,903, Nov. 9, 1984, abandoned. This application Sep. 4, 1985, Ser. No. 772,496

Int. Cl.[4] C02F *5/10*

U.S. Cl. 252—180 **9 Claims**

1. A process for inhibiting corrosion and the formation and deposition of scale and iron oxide in an aqueous system, comprising adding to said system at least 0.1 ppm of a water soluble polymer having an intrinsic viscosity of 0.05 to 2.5 dl/g, prepared from:

(a) 35 to 90%, by weight, of an unsaturated carboxylic acid, or its salt;

(b) 5 to 40%, by weight, of an unsaturated sulfonic acid, or its salt; and

(c) 5 to 40%, by weight, of an unsaturated, polyalkylene oxide compound, the total of (a), (b), and (c) being 100% by weight of the polymer.

4,618,449

METHOD FOR THE TERMINATION OF LIVING POLYMERS, AND COMPOUNDS SUITABLE FOR THE PURPOSE

Arnaldo Roggero, and Mario Bruzzone, both of Milan, Italy, assignors to Enichem Polimeri, S.p.A., Sassari, Italy

Filed Apr. 19, 1984, Ser. No. 602,213

Claims priority, application Italy, May 3, 1983, 20904 A/83

Int. Cl.[4] C07D *213/06;* **C08F** *2/38*

U.S. Cl. 252—182 **1 Claim**

1. A coupling agent for living macroanions comprising a mixture of 2,6-distyrylpyridine and 2,4,6-tristyrylpyridine.

4,618,450

AQUEOUS SYSTEMS CONTAINING AMINO SULFONIC ACID DERIVATIVES OF CARBOXYLIC ACIDS

William A. Higgins, Gates Mills, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Nov. 7, 1984, Ser. No. 669,173

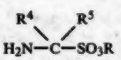
Int. Cl.[4] B01F *17/24;* **B01J** *13/00*

U.S. Cl. 252—355 **8 Claims**

1. An aqueous system comprising:

at least about 70% by weight of water based on the weight of the aqueous system; and

about 3% to about 6% by weight based on the weight of the aqueous system of an imido hydrocarbyl sulfonic acid or salt thereof obtained by reacting a hydrocarbyl substituted succinic acid or anhydride with an amino hydrocarbyl sulfonic acid or salt thereof having the formula



wherein R^4 and R^5 are each independently hydrogen, alkyl or aromatic and R is hydrogen or a cation.

4,618,451

SYNTHESIS GAS

Colin W. Gent, Yarm, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Mar. 27, 1984, Ser. No. 594,014

Claims priority, application United Kingdom, Apr. 6, 1983, 8309359

Int. Cl.[4] C01B *3/38*

U.S. Cl. 252—373 **5 Claims**

1. In a continuous process of producing a gas stream com-

prising hydrogen and carbon oxides having a ratio R in the range 1.5 to 2.22 where R is defined as

$$R = \frac{H_2 - CO_2}{CO + CO_2}$$

where H_2, CO, and CO_2 represent the number of moles of these gases in said gas stream, by the steps of

(a) reacting a normally gaseous hydrocarbon feedstock with oxygen, the proportion of oxygen being less than sufficient for complete combustion, but sufficient to avoid substantial by-product carbon formation, whereby a hot gas stream at a temperature in the range 1093°–1260° C. is produced;

(b) mixing a further amount of said normally gaseous hydrocarbon into said hot gas stream;

(c) reacting the whole of the resulting gas mixture adiabatically over a steam reforming catalyst comprising a Group VIII metal on a heat resistant support, whereby to increase the ratio R from that of said hot gas and to decrease the temperature of the gas mixture to give a product gas at a temperature in the range 750°–950° C. and at a pressure in the range 5 to 50 bar abs.;

the improvement whereby a compressed gas stream that is suitable for methanol synthesis at a pressure in the range 20 to 120 bar abs. is provided by

(i) in step (b) adding steam as well as said further hydrocarbon to said hot gas stream whereby the product gas produced in step (c) contains unreacted steam;

(ii) cooling the product gas produced in step (c) by expansion in a turbine;

(iii) cooling the expanded gas produced in step (ii) further and separating water, but not carbon dioxide, therefrom; and

(iv) compressing the resultant water-depleted gas to said methanol synthesis pressure in a compressor powered by said turbine.

4,618,452

SPOT TEST FOR 1,3,5-TRIAMINO-2,4,6-TRINITROBENZENE, TATB

Betty W. Harris, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 29, 1984, Ser. No. 676,149

Int. Cl.[4] G01N *31/00, 33/00*

U.S. Cl. 252—408.1 **11 Claims**

1. A method for the identification of materials containing 1,3,5-triamino-2,4,6-trinitrobenzene, said method comprising the steps of:

a. rinsing the material thoroughly with a solvent in order to remove significant concentrations of explosive substances present in the materials under investigation in which the 1,3,5-triamino-2,4,6-trinitrobenzene is substantially insoluble;

b. forming a homogeneous suspension of a liquid which comprises between 5 and 20 weight percent of a water-soluble strong base, between 5 and 20 weight percent of water and the remainder a solvent for 1,3,5-triamino-2,4,6-trinitrobenzene, the solvent for 1,3,5-triamino-2,4,6-trinitrobenzene having a slight solubility for the water with the water-soluble strong base dissolved therein;

c. contacting said thoroughly rinsed material with said homogeneous suspension; and

d. observing the color of the liquid resulting therefrom, whereby a bright orange color results if 1,3,5-triamino-2,4,6-trinitrobenzene is present in the material.

4,618,453

CONDUCTIVE HETEROCYCLIC LADDER POLYMERS

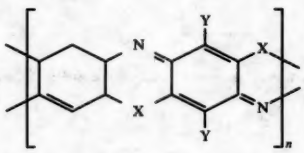
Oh-Kil Kim, Burke, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 30, 1985, Ser. No. 739,354

Int. Cl.[4] C08G *8/02*; H01B *1/00*

U.S. Cl. 252—500 **14 Claims**

1. A polymer of the formula:



wherein X is a chalcogen;

wherein Y is hydrogen or halogen; and n is the number of repeating units of said polymer.

4,618,454

CONDUCTING POLYMERS

Denis G. H. Ballard, Littleton; Kenneth T. Moran, Runcorn, and Ian M. Shirley, Weaverham, all of England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 597,389, Apr. 6, 1984, Pat. No. 4,548,737. This application Jul. 5, 1985, Ser. No. 751,873

Claims priority, application United Kingdom, Apr. 6, 1983, 8309362

Int. Cl.[4] A01B *1/00*

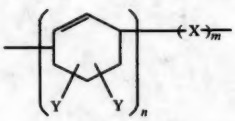
U.S. Cl. 252—500 **5 Claims**

1. A process for the preparation of an electrically conducting composition which process comprises:

(A) the steps of doping a poly(1,2-disubstitutedcyclohexa-3,5-diene) with a suitable doping agent and then converting the said polycyclohexadiene into a polyarylene; or

(B) the steps of converting a poly(1,2-disubstituted-cyclohexa-3,5-diene) into a polyarylene and then doping the polyarylene with a suitable doping agent wherein

(C) the said polycyclohexadiene has the structure



wherein

the cyclohexenylene ring and X, where X is present, may vary from unit to unit in the polymer chain,

each Y, which may be the same or different, is amide, halide, thioester, urethane, xanthate or OR′ where each R′ is hydrogen, hydrocarbyl, aroyl, alkanoyl or R^2OCO where R^2 is aryl or an alkyl group having up to 10 carbon atoms,

X is a residue of one or more polymerisable comonomers selected from the group consisting of styrene, methacrylates, vinyl halides, vinyl esters, acrylonitrile, tetrafluoroethylene and sulphur dioxide,

n and m are whole numbers and the ratio of n:m lies in the range 1:0 to 1:100;

(D) the said suitable doping agent is selected from the group consisting of Group IA metals, Group IA metal arenes, Bronsted acids, non-metal oxides, Group VB sulphides and halides of Groups VB, VIA, IB, IIB, IVB and the inert gases;

(E) wherein the concentration of doping agent in the electri-

cally conducting composition is from about 10^{-5} to 0.5 mole per mole of arylene unit in the polyarylene.

4,618,455

PROCESS FOR PREPARING CRYSTALLINE SALTS OF ACETOACETAMIDE-N-SULFOFLUORIDE

Adolf Linkies, Frankfurt am Main, and Dieter Reuschling, Butzbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 19, 1985, Ser. No. 713,466

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1984, 3410233

Int. Cl.[4] C07C *143/70*

U.S. Cl. 260—543 F **7 Claims**

1. A process for preparing crystalline salts of acetoacetamide-N-sulfofluoride by reacting amidosulfofluoride H_2NSO_2F with diketene in the presence of bases in an inert organic solvent, wherein the bases used are inorganic bases.

4,618,456

ETHYNYLATION OF 16-METHYL-17-KETO STEROIDS

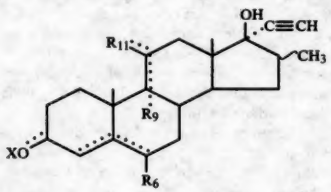
Joseph M. Timko, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 591,631, Mar. 20, 1984, abandoned. This application Apr. 26, 1984, Ser. No. 604,091

Int. Cl.[4] C07J *1/00*

U.S. Cl. 260—397.4 **23 Claims**

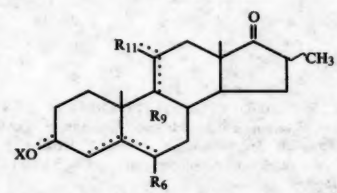
1. A process for the preparation of a C_3 protected form of a 17α-ethynyl-17β-hydroxy-16-methyl steroid of the formula



(IIA,C)

with less than 2% epimerization which comprises

(1) contacting a C_3 protected form of a 17-keto-16-methyl steroid of the formula



(IA,C)

with monolithium acetylide in a dry solvent at a temperature of about −10° or less in the absence of ethylene diamine

(2) maintaining the reaction temperature at about −10° or less and

(3) quenching with a quenching agent where

R_6 is a hydrogen or fluorine atom, methyl or methylene group; when R_6 is methylene, there is no 5–6 double bond in formula (A) or in formula (C);

R_9 is nothing, a hydrogen, fluorine or oxygen atom which makes the C-ring

(a) $\Delta^9(11)$ when R_9 is nothing and

(b) 9β,11β-epoxide when R_9 is an oxygen atom and ····· between C_{11} and R_{11} is a single bond, and

(c) a ketone when R_{11} is an oxygen atom and ····· between C_{11} and R_{11} is a double bond;

X is a hydrogen atom or nothing, when X is nothing, the ····· at C_3 is a double bond, when X is a hydrogen atom the ····· at C_3 is a single bond;

is a single or double bond; and

~ indicates that the attached atom or group can be in either the α or β configuration.

4,618,457

SULFONATED POLYOXYALKYLENE ETHERS OF 1,2 OR 1,3-DIOLS, THEIR PREPARATION AND USE

Eberhard Esselborn, Essen, and Jürgen Fock, Duesseldorf, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Mar. 1, 1985, Ser. No. 707,056

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407563

Int. Cl.[4] C07C *139/00, 143/02;* C08K *5/05*

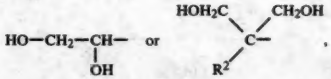
U.S. Cl. 260—504 R **1 Claim**

1. Compounds having the formula

$$R^1CH_2O-(C_2H_4O-)_n(C_3H_6O-)_mCH_2CHR^3C-H_2-SO_3X$$

in which

R^1 is



R2 is CH_3—, C_2H_5—, or C_3H_7—,

R^3 is H— or CH_3—,

X is H—, alkali metal or ammonium ion,

n is 0 to 100,

m is 0 to 50, and

n+m is not less than 1.

4,618,458

SULPHONIC ACIDS AND SULPHONATES

Marcel Prillieux, Mont-Saint-Aignan; Robert M. Laurent, Bois Guillaume, and Robert Tirtiaux, Mont-Saint-Aignan, all of France, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 973,032, Dec. 26, 1978, abandoned. This application Nov. 3, 1980, Ser. No. 203,169

Claims priority, application United Kingdom, Dec. 23, 1977, 53638/77

Int. Cl.[4] C07C *143/24*

U.S. Cl. 260—505 P **6 Claims**

1. In an oleum sulfonation process wherein an alkaryl alkylate, having alkyl groups of 20 to 30 carbon atoms and an aryl group selected from the group consisting of benzene, toluene and xylene, is treated with oleum to form a sulfonated product, settling said sulfonated product to separate impurities and sulfuric acid to thereby give a crude alkaryl sulfonic acid containing more than 3 wt. % sulfuric acid, the improvement which comprises washing said crude alkaryl sulphonic acid, to reduce the sulfuric acid content to no more than 3 wt. % sulfuric acid, with from 1% to 30% by weight, based on the weight of the alkylate from which the sulphonic acid is derived, of water, allowing the resulting mixture to separate and removing the aqueous layer; adding 2 to 10% by weight based on the weight of the alkylate from which the sulphonic acid is derived of a liquid oil soluble monoolefin of 9 to 30 carbon atoms and subsequently heating the sulphonic acid containing the olefin to a temperature in the range of about 100° C. to about 150° C. for at least 15 minutes to about one hour, and recovering a purified sulfonic acid containing less than 0.5 wt. % sulfuric acid.

4,618,459

SUBSTITUTED 2,4-DIALKOXY BENZENE SULFONYL CHLORIDES

Jean-Paul Fournier, Versailles, and Patrick Choay, Paris, both of France, assignors to Choay S.A., Paris, France

Continuation of Ser. No. 371,451, Apr. 23, 1982. This application Dec. 30, 1983, Ser. No. 567,161

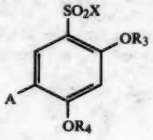
Claims priority, application France, Apr. 23, 1981, 81 08126

The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.

Int. Cl.[4] C07C *143/70, 147/06*

U.S. Cl. 260—543 R 10 Claims

1. A sulfohalide of the formula:



wherein:

X is chlorine or bromine;

R_3 and R_4 is alkyl from 1 to 4 carbon atoms;

A is Cl, Br, CF_3, NO_2 or alkyl sulfonyl having from 1 to 4 carbons;

provided that when X is Cl and R_3 and R_4 both are CH_3, A is different from Cl.

4,618,460

PROCESS FOR THE PREPARATION OF ACETIC ANHYDRIDE

Jean Gauthier-Lafaye, Lyons, and Robert Perron, Charly, both of France, assignors to Rhone-Poulenc Industries, Courbevoie, France

Continuation of Ser. No. 331,809, Dec. 17, 1981, abandoned. This application Mar. 7, 1984, Ser. No. 585,625

Claims priority, application France, Dec. 24, 1980, 80 27942

Int. Cl.[4] C07C *51/56*

U.S. Cl. 260—549 26 Claims

1. A process for the preparation of acetic anhydride which comprises carbonylating methyl acetate in the liquid phase, in a carboxylic acid which represents from about 10 to about 90% by volume of the reaction liquid, in the presence of an effective amount of nickel, methyl iodide, an ionic iodide, and a co-catalyst, the ionic iodide being selected from the group consisting of quaternary ammonium iodides, quaternary phosphonium iodides, sodium iodide, potassium iodide and cesium iodide when the co-catalyst is a lithium salt, and the ionic iodide being selected from the group consisting of sodium iodide, potassium iodide and cesium iodide when the co-catalyst is an alkaline earth metal salt, at a total pressure between about 25 and about 200 bars.

4,618,461

O,O'-, O,S'- OR S,S'-DITHIODIALKYLENE-BIS(MONO- OR DIHYDROCARBYL CARBAMOTHIOATES) AND S,S'-DITHIODIALKYLENE-BIS(MONO- OR DIHYDROCARBYL CARBAMODITHIOATES) AND METHOD OF PREPARATION THEREOF

Roger W. Bergman, and Harry A. Smith, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 25, 1983, Ser. No. 517,180

Int. Cl.[4] C07C *155/02, 155/08*

U.S. Cl. 558—234 22 Claims

1. O,O'-, O,S'- or S,S'-dithiodialkylene-bis(mono- or dihydrocarbyl carbamothioates) and S,S'-dithiodialkylene-bis(-mono- or dihydrocarbyl carbamodithioates).

4,618,462

HUMIDIFIER WITH CONTROLLED HEAT INPUT

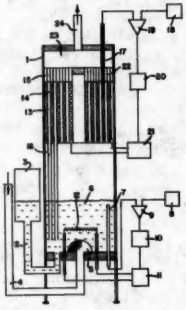
Robert S. Fisher, 2 Haite Close, West Pymble, New South Wales, 2073, Australia

Filed Oct. 17, 1984, Ser. No. 663,073

Claims priority, application Australia, Oct. 24, 1983, PG2001

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—130 8 Claims



1. A humidifier for evaporating a liquid into a gas comprising:

a bubble humidifier including a gas inlet and a bubble chamber containing said liquid and connected in gas flow communication with said gas inlet;

a labyrinth extended surface humidifier positioned in spaced relation above said liquid connected in gas flow communication with said bubble chamber and an extend surface element located throughout said surface humidifier;

a series of capillary action water transmitting means connecting said liquid in said bubble chamber and said surface element in said surface humidifier;

a first heat generating means for heating the liquid in said bubble chamber; and

a first temperature control means responsive to temperature within the bubble chamber for controlling the operation of said first heat generating means.

4,618,463

PROCESS FOR PRODUCING PITCH CARBON FIBERS

Seiichi Uemura, Tokyo; Takao Hirose, Kamakura; Yoshio Shohda, Kawasaki; Takayoshi Sakamoto, Hiratsuka, and Kenji Katoh, Kawasaki, all of Japan, assignors to Nippon Oil Company, Japan

Filed Dec. 18, 1984, Ser. No. 682,679

Claims priority, application Japan, Dec. 20, 1983, 58-238836

Int. Cl.[4] D01F *9/22, 9/12*

U.S. Cl. 264—29.2 4 Claims

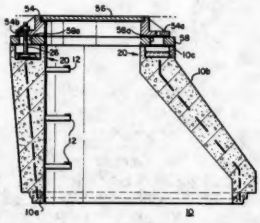
1. In a process for producing pitch carbon fibers by subjecting pitch fibers obtained by melt-spinning a carbonaceous pitch to infusiblization treatment and then to carbonization treatment or both carbonization treatment and subsequent graphitization treatment, the improvement comprises applying a dimethyl polysiloxane having a viscosity at 25° C. in the range of 12,000 to 1,000,000 cSt to the fibers after the infusiblization treatment, and subjecting the infusiblized fibers with the dimethyl polysiloxane applied thereto to the carbonization treatment or both the carbonization treatment and the subsequent graphitization treatment.

4,618,464

PRECAST CONCRETE MANHOLE ADJUSTABLE BOLT SLOT FOR SECURING CAST IRON FRAME AND COVER AND METHOD FOR CASTING SAME

Jack Ditcher, Langhorne, Pa., assignor to A-Lok Products, Incorporated, Tullytown, Pa.

Filed Jul. 19, 1984, Ser. No. 632,392
Int. Cl.[4] B28B 5/00, 7/00
U.S. Cl. 264—35 13 Claims



1. Molding apparatus for providing an elongated bolt slot in a manhole top section for accomodating manhole cover frames of varying diameter said molding apparatus including:

a mold assembly comprising inner and outer mold members which collectively form a hollow interior region defining the shape of the manhole top section;

channel forming lugs being arranged at spaced intervals about the top end of said mold members and providing receiving channels for a retaining slide member having a main body portion whose long sides are received by the aforesaid channels and being provided with first and second elongated flange receiving channels arranged along the long sides of said member with the open ends of said channels facing one another;

the channels of said retaining slide members slideably receiving the flanges of an insert comprising a hollow, elongated fully enclosed member having an interior of substantially T-shaped cross-section transverse to its length;

said flanges of said insert being a pair of outwardly directed flanges arranged along the long sides of said elongated insert for slideable insertion into the flange receiving channels of said retaining slide member for holding the insert in position within the hollow interior of said mold assembly during the casting of said manhole top section;

said slideable member being slideably removed from said channel forming lugs to release said insert flanges from said flange receiving channels after the top section has been cast and cured.

7. A method for producing manhold top sections to facilitate the threaded fastening of a cover frame thereto comprising the steps of:

providing a mold assembly having a hollow interior defining the shape of the manhole top section to be cast;

providing an elongated insert having a hollow interior of a substantially T-shaped cross-sectional configuration which cross sectional configuration is substantially uniform over the length of said insert;

said mold assembly having channel forming members along the top end thereof;

slideably inserting a slidable insert positioning member into the channels of said channel forming members for supporting said slideable member along the top of said mold assembly and extending between said inner and outer mold members;

said slideable member having a pair of flange receiving channels for slideably receiving the flanges provided along the upper end of said insert;

holding an insert in the hollow interior region near the top of said mold assembly and adjacent said channel forming members;

sliding said slideable member into the channels formed by said channel forming member and so that the flanges of said insert are slideably received by the flange receiving channels of said slideable member;

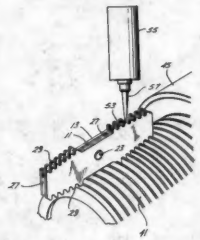
pouring the cast material into said mold to fill said mold and engage the bottom and sides of said insert so as to retain said insert within the manhole top section when the cast material has cured.

4,618,465

METHOD AND APPARATUS FOR FORMING A THREAD PROFILE IMPRESSION

Jimmy C. Parks, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Apr. 26, 1982, Ser. No. 371,394
Int. Cl.[4] B29C 33/40
U.S. Cl. 264—40.1 5 Claims



1. A method for determining whether a thread conforms with a norm in the laboratory without having to transport the thread itself thereto comprising:

placing two flat plates having serrated edges that are correlative to the same thread in side-by-side, parallel and spaced apart position, thereby forming a gap therebetween;

securing the two plates in such side-by-side, parallel and spaced apart position;

positioning the two flat plates across the thread in such a manner that the serrations of the serrated edges are in mating engagement with the roots and the crests of the thread;

caulking the junctures of the serrated edges of the blades and the thread;

filling the gap with a self-curing plastic material;

packing the self-curing plastic material into the gap;

allowing the plastic material to harden to form a cast of the thread profile;

removing the cast from the gap;

sending the cast to the laboratory for inspection; and

inspecting the cast of the thread profile for conformance with a norm.

2. An apparatus adapted to fit on the surface of a thread and to form a mold therewith for making a cast showing a profile of the thread comprising:

a first flat plate having a serrated portion with serrations correlative to the profile of the thread;

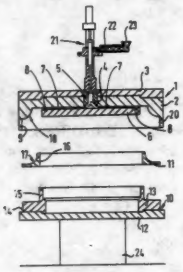
a second flat plate having a serrated portion with serrations also correlative to the profile of the same thread; and

positioning means positioning said first and said second plates in side-by-side, parallel and spaced apart position, thereby forming a gap therebetween.

4,618,466
MOULDING APPARATUS

James N. McGlashen, Winstanley, and Colin Holroyd, Southport, both of England, assignors to Apsley Metals Limited, England

Filed Sep. 27, 1983, Ser. No. 536,400
Claims priority, application United Kingdom, Oct. 21, 1982, 8230139
Int. Cl.[4] B29C 45/14, 45/78, 45/80
U.S. Cl. 264—40.6 7 Claims



1. Moulding apparatus for moulding a component of unvulcanized elastomeric material, comprising in operable combination:

(a) first and second mould members defining a moulding cavity, the two members being slidably movable relative to each other to change the volume of the cavity from a first, larger value to a second, smaller value;

(b) a feed port formed in the first mould member through which elastomeric material to be moulded is fed to fill the cavity having the first, larger value of volume;

(c) means to relatively move the members to change the volume of the cavity to the second, smaller value, thereby pushing some material back into the feed port, the material remaining in the cavity becoming the moulded component; and

(d) a detachable component carrying insert positionable within the moulding cavity and carried by the second moulding member and positioned to be contacted by elastomeric material admitted into the moulding cavity from the feed port by means of which insert the moulded component of unvulcanized elastomeric material, while attached to the insert, may be removed from the cavity when the first and second mould members are separated.

4,618,467
METHOD FOR SEALING CAVITIES

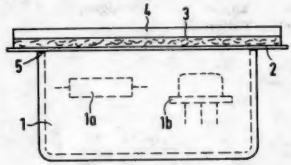
Hans-Joachim Burger, Kummersbruck, and Hubert Schuster, Oberleinsiedl, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Nov. 29, 1984, Ser. No. 676,181
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343534
Int. Cl.[4] B29C 39/10, 67/22; C08G 18/14
U.S. Cl. 264—46.6 18 Claims

1. A method for sealing cavities having one open side and adapted to receive electrical or electronic components therein, comprising the steps of:

disposing a measured quantity of encapsulant into the cavity:

placing a layer of a releasable permeable absorbent synthetic resin fabric across said open side and overlapping the edge thereof:



allowing the encapsulant to harden against said fabric; and

removing said fabric.

4,618,468
METHOD FOR CONTROLLING BEAD SIZE IN THE PRODUCTION OF EXPANDABLE STYRENE POLYMERS BY SUSPENSION POLYMERIZATION

Josef K. Rigler, Recklinghausen, and Horst Leithäuser, Marl, both of Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,451
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1983, 3331570
Int. Cl.[4] C08J 9/14, 9/20, 9/22; C08F 2/20
U.S. Cl. 264—53 14 Claims

1. In a process for the preparation of shaped bodies based on expanded styrene polymers comprising: the polymerization of styrene or a mixture thereof with at least one monomer copolymerizable therewith in an aqueous suspension having an aqueous phase and an organic phase containing said styrene, in the presence of an organic protective colloid and radical forming initiators and expanding agent, pre-foaming of the resulting expandable particles, aging of the foamed particles and molding thereof in a pressure-resistant mold, the improvement comprising:

(a) dissolving said organic protective colloid in said aqueous phase which has a K value of 15 to 100 and is homogeneously soluble therein in the range between 25° and 125° C. at a concentration of 0.01 to 0.3 part/100 parts of water;

(b) adding said organic phase containing said initiators to said aqueous phase;

(c) maintaining a boundary surface tension between said aqueous phase and said organic phase above 18 N/mm^2;

(d) varying the molecular weight of said organic protective colloid as indicated by said K value between 15 to 100;

(e) maintaining the ratio of said aqueous phase to said organic phase greater than 0.9:1; and

(f) polymerizing the mixture so prepared.

4,618,469
FLAME-RETARDANT ACRYLIC FIBERS AND PROCESS FOR PREPARING SAME

Takahiro Ogawa, Kobe; Masahiko Takada, Akashi; Takaharu Matsumoto, Takasago, and Youichi Kanbara, Kakogawa, all of Japan, assignors to Kanegafuchi Kaguku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 7, 1984, Ser. No. 607,476
Claims priority, application Japan, May 6, 1983, 58-79799; May 10, 1983, 58-82296
Int. Cl.[4] C08K 3/16, 5/09, 3/30, 3/10
U.S. Cl. 264—182 16 Claims

1. A flame-retardant acrylic fiber as defined in claim 1, wherein said fiber is prepared by the process comprising: (1) preparing a reaction mixture comprising acrylonitrile and a vinyl monomer copolymerizable therewith in an aqueous system, (2) carrying out polymerization, wherein a water-soluble tin compound is admixed with said reaction mixture prior to,

during and/or after polymerization, (3) separating the resulting polymer and tin compound from the aqueous system, (4) purifying the separated mixture of polymer and tin compound, (5) mixing the resulting product with a solvent for the polymer and (6) spinning the resulting mixture to form said fiber, said tin compound being present in the fiber in an amount sufficient to impart flame retardancy and having an average particle size of up to 100 mμ.

4,618,470

MAGNETIC CONFINEMENT NUCLEAR ENERGY GENERATOR

Winfield W. Salisbury, Scottsdale, Ariz., assignor to Austin N. Stanton, Dallas, Tex., a part interest

Filed Dec. 1, 1982, Ser. No. 445,934
Int. Cl.[4] G21B *1/00*
U.S. Cl. 376—123 **3 Claims**

1. A fusion reactor comprising:
a sphere defining an inner surface and having a center;
superconducting coil means disposed substantially at the center of said sphere for producing a first magnetic field centered within said sphere;
coil means disposed circumferentially around said sphere for producing a second magnetic field;
means for injecting a gas containing fusible ions into said sphere;
said first and second magnetic fields defining cusps adjacent said superconducting coil means to form back-to-back magnetic mirrors for containing and compressing said ions;
means for heating said gas within the interior of said sphere to permit collisions between ions within said sphere; and
means disposed adjacent said inner surface of said sphere responsive to energy produced from said ion collisions.

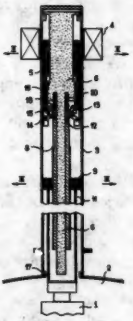
4,618,471

ELECTROMAGNETIC SAFETY DEVICE OF A SCREW/NUT TYPE

Jacques B. Defaucheux, and Freddy Guedj, both of Jeumont, France, assignors to Jeumont-Schneider, Puteaux and Framatone, Courbevoil, both of, France

Continuation of Ser. No. 226,015, Jan. 19, 1981, abandoned. This application Oct. 13, 1983, Ser. No. 541,482
Claims priority, application France, Jan. 24, 1980, 80 01515
Int. Cl.[4] G21C *7/12*
U.S. Cl. 376—228 **11 Claims**

1. In a nuclear reactor having a control rod, an electromagnetic safety apparatus for longitudinal displacement of said control rod, said apparatus comprising, in combination, a vertically elongated container, stator means at an upper part of the container for providing a rotating magnetic field in said upper part, rotor means disposed in the container adjacent to the stator means for rotation by the field of the stator means about an axis extending along the length of the container, a shaft extending along the length of the container and supported therein for rotation about said axis, said shaft being coupled to said rotor means for rotation therewith, a hollow threaded rod supported on said shaft for translation along the shaft, said hollow threaded rod being coupled to the shaft for rotation therewith, a nut having threads engaged with the threads of the hollow threaded rod and being supported in the container for translation along the length of the container but held against rotation in the container, said nut supporting said control rod, and locking means movable between a locked position at which the locking means engages an upper part of said hollow threaded rod and holds said hollow threaded rod at an elevated position on said shaft and an unlocked position at which the locking means disengages said hollow threaded rod



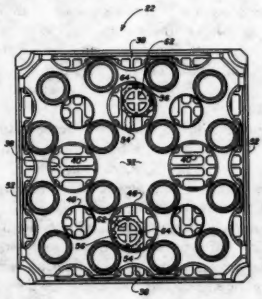
to permit said hollow threaded rod and said nut to fall toward the bottom of said container, whereby said control rod may be lowered rapidly, said apparatus being characterized in that the rotor means is supported for translation along said shaft and is moved by said field of said stator means in translation in a first direction while it is rotated by said field, and in that said rotor means is coupled to said locking means and actuates said locking means to engage and hold said hollow threaded rod at said elevated position when said rotor means moves in said first direction.

4,618,472

NUCLEAR REACTOR FUEL ASSEMBLY WITH FUEL ROD REMOVAL MEANS

Robert K. Gjertsen, Monroeville; John F. Wilson, and Walter F. Weiland, Jr., both of Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 25, 1983, Ser. No. 545,419
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—446 **11 Claims**



1. A fuel assembly for a nuclear reactor including a bottom nozzle, at least one longitudinally extending control rod guide thimble attached to and projecting upwardly from the bottom nozzle, a plurality of transverse grids spaced along said thimble, an organized array of elongated fuel rods transversely

spaced and supported by said grids and axially captured between said bottom nozzle and a top nozzle which comprises:

(a) a transversely extending adapter plate formed by an arrangement of integral cross-laced ligaments defining a plurality of coolant flow openings;

(b) means for mounting said adapter plate on an upper end portion of said thimble and spaced axially above and disposed transversely over the upper ends of all of said fuel rods present in said fuel assembly such that ones of said ligaments overlie corresponding ones of said fuel rods so as to prevent said fuel rods from moving upwardly through said coolant flow openings; and

(c) removable plug means confined within said adapter plate and positioned over and spaced axially above selected ones of said fuel rods in providing access to at least one fuel rod for removal thereof upwardly through said axially spaced adapter plate without removing said top nozzle from said fuel assembly, said removable plug means including

(i) a retainer portion being disposed between and fixedly retained by adjacent ones of said ligaments and having a bore defined therethrough,

(ii) a removable plug portion being of a cylindrical shape adapted to be removably inserted into said bore of said retainer portion, and

(iii) means for releasably locking said plug portion in its inserted position within said retainer portion, said locking means including indentations on the top surface of said retainer portion adjacent said bore and upstanding tabs on said plug portion adapted to be bent over into locking engagement with said indentations.

4,618,473

IRON POWDER ARTICLE HAVING IMPROVED TOUGHNESS

William F. Jandeska, Jr., Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 14, 1985, Ser. No. 745,353
Int. Cl.[4] B22F *1/00*
U.S. Cl. 419—11 **3 Claims**

1. A method for forming a cohesive article from iron powder comprising

compacting a powder mixture comprising a suitable low-carbon iron powder, carbon powder in an amount effective for diffusion into the iron mass to produce a carbon content suitable to form a pearlitic or martensitic microstructure, and a powder composed of a nickel boron compound suitable for forming a liquid phase at iron sintering temperatures,

sintering the powder compact at a temperature and for a time effective to diffusion bond the iron into an integral structure having pores, to diffuse carbon into the iron structure, to cause said nickel boron to form a transient liquid phase that wets pore surfaces, and to diffuse nickel and boron from said liquid phase into the iron structure, said nickel diffusion being limited to regions about the pores that are austenitic at said sintering temperature,

and cooling the sintered structure to form the article, whereupon a major portion of the iron alloy structure transforms to a pearlitic or martensitic microstructure, but whereupon the nickel-enriched iron alloy regions about the pores comprise retained austenite suitable to retard crack formation and thereby enhance mechanical properties of the article.

4,618,474

CO-BASE HEAT RESISTANT ALLOY

Junya Ohe, Urawa; Saburo Wakita, Omiya; Kiichi Yamatsuta; Shoji Goto, both of Kanagawa; Yukinori Kutsukake, Tokyo, and Masuo Sugizaki, Yokohama, all of Japan, assignors to Asahi Fiber Glass Company, Limited; Asahi Glass Company, Limited and Mitsubishi Kinzoku Kabushiki Kaisha, all of Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 694,791
Int. Cl.[4] C22C *19/07*
U.S. Cl. 420—436 **8 Claims**

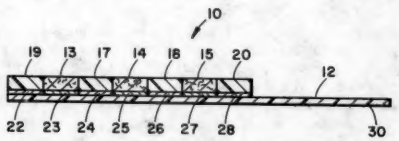
1. A Co-base heat resistant alloy consisting essentially of:
from 0.05 to 1% by weight of C,
from 0.05 to 2% by weight of one or both of Si and Mn,
from 35 to 40% by weight of Cr,
from 5 to 15% by weight of Ni,
from 2 to 12% by weight of one or both of W and Mo,
from 0.1 to 5% by weight of Hf,
the rest being Co and unavoidable impurities, with the proviso that iron may be present in amount of up to 3% by weight.

4,618,475

REAGENT TEST DEVICE CONTAINING HYDROPHOBIC BARRIERS

Joseph Y. Wang, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 30, 1985, Ser. No. 771,061
Int. Cl.[4] G01N *21/78, 33/52*
U.S. Cl. 422—56 **8 Claims**



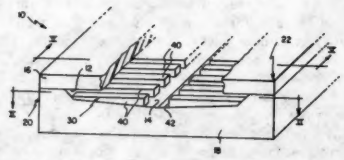
1. A reagent test device comprising multiple reagent carrier matrices attached in spaced relationship to one side of a substrate, with hydrophobic barrier pads of identical height to the reagent carrier matrices attached to the same side of the substrate between the reagent carrier matrices and in physical contact with the reagent carrier matrices to protect the reagent carrier matrices from abrasion and to prevent liquid runover between adjoining spaced carrier matrices.

4,618,476

CAPILLARY TRANSPORT DEVICE HAVING SPEED AND MENISCUS CONTROL MEANS

Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 579,056, Feb. 10, 1984, abandoned. This application Oct. 31, 1984, Ser. No. 666,719
Int. Cl.[4] G01N *1/00, 27/46*
U.S. Cl. 422—100 **8 Claims**



1. In a liquid transport device having two opposed surfaces spaced apart a distance effective to create a capillary transport

zone and to induce capillary flow between said surfaces of introduced liquid, said opposed surfaces being joined together at opposite edges of said zone, whereby flow of introduced liquid and air is confined between said edges, and access means for admitting liquids to said zone.

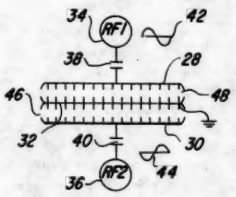
the improvement wherein one of said surfaces includes: (a) spaced-apart energy barriers extending across a portion of a primary direction of travel of liquid through said zone between said edges, said barriers (i) having a height less than said distance between said surfaces and (ii) being effective to retard the rate of flow of liquid through said zone, and (b) means on said one sufface for initiating liquid flow past each of said energy barriers at a predetermined location between said edges.

4,618,477

UNIFORM PLASMA FOR DRILL SMEAR REMOVAL REACTOR

Suryadevara V. Babu, Potsdam; Ronald S. Horwath, Binghamton; Neng-hsing Lu, Endwell, and John A. Welsh, Binghamton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 17, 1985, Ser. No. 692,145
Int. Cl.[4] B01J *19/08, 19/12;* **C23F** *1/02*
U.S. Cl. 422—186.29 **31 Claims**



1. An apparatus for generating a substantially uniform plasma for processing a substrate having two major surfaces, each of said major surfaces having electrically conductive portions disposed thereon, comprising:

(a) two electrode means oppositely disposed with respect to one another on either side of said substrate;

(b) a first radio frequency power source operatively connected to the first of said electrode means; and

(c) a second radio frequency power source operatively connected to the second of said electrode means, said second radio frequency power source being out of phase with respect to said first radio frequency power source.

4,618,478

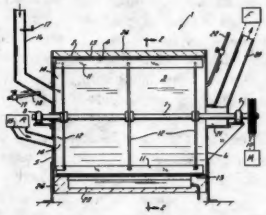
APPARATUS FOR THE PRODUCTION OF LEAD OXIDE

Benjamin F. McKinney, Indianapolis, Ind., assignor to Oxide & Chemical Corporation, Indianapolis, Ind.

Division of Ser. No. 490,149, Apr. 29, 1983, Pat. No. 4,521,399. This application Apr. 1, 1985, Ser. No. 718,500
Int. Cl.[4] B01F *7/04*
U.S. Cl. 422—198 **3 Claims**

1. In a reactor for the oxidation of lead particles to produce litharge with selectively varying free lead content includ.pa ing a horizontally disposed reactor chamber having a cylindrical interior surface and parallel opposite end walls, a shaft extending through the interior and supported for rotation on the longitudinal axis of the chamber, at least one pair of blades attached to the shaft, said at least one pair of blades being disposed generally parallel to the cylindrical surface and extending substantially the full axial length thereof, lead inlet means, water inlet means and air inlet means positioned with respect to one of said end walls for admitting supplies of lead, air and water to the interior of the chamber, an outlet in the other of said end walls for discharging the litharge therefrom, and means for producing a flow of air through the chamber to oxidize the lead particles and transport the litharge to the outlet; the improvement comprising:

the at least one pair of blades having radially outer edges which are disposed in closely spaced relation to the interior surface of the chamber to provide a uniform zone for oxidation, attrition and classification along substantially



the entire blade edge-reactor interior surface interface; and,

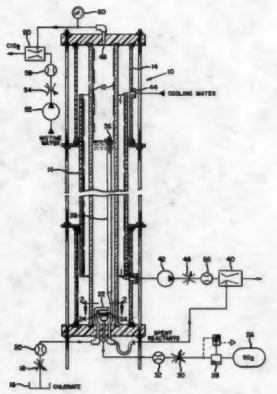
drive means for rotating the shaft and at least one pair of blades at a speed sufficient to maintain incompletely oxidized lead particles within the oxidation and attrition zone and to effect centrifugal classification of the litharge for transport to the outlet.

4,618,479

APPARATUS FOR PRODUCING CHLORINE DIOXIDE

Paul W. Santillie, Richland, and Daniel M. Ramras, Seattle, both of Wash., assignors to Lamb-Weston, Inc., Portland, Oreg.

Division of Ser. No. 313,256, Oct. 21, 1981, Pat. No. 4,451,444. This application Jan. 24, 1984, Ser. No. 573,463
Int. Cl.[4] B01J *8/02;* **C01B** *11/02;* **F28D** *21/00*
U.S. Cl. 422—202 **6 Claims**



1. An apparatus for the continuous production of gaseous chlorine dioxide by the reaction between gaseous sulfur dioxide and an aqueous solution of a metallic chlorate, said apparatus comprising:

(a) a vertically-oriented reaction chamber;

(b) a source of an aqueous solution of a metallic chlorate and means for introducing said aqueous solution into the bottom of said reaction chamber;

(c) a source of gaseous sulfur dioxide and means for introducing said sulfur dioxide into the bottom of said reaction

chamber and bringing said sulfur dioxide into contact with said aqeous solution;

(d) means for withdrawing from the top of said reaction chamber gaseous chlorine dioxide;

(e) means for withdrawing spent reactant liquors at an intermediate point of said reaction chamber;

(f) flow means for maintaining a flow of coolant liquid in contact with the exterior surface of said reaction chamber to remove heat from said reaction chamber;

(g) eductor means in fluid communication with the flow means, said eductor means also being in fluid communication with said reaction chamber for withdrawing chlorine dioxide and spent reactant liquors therefrom; and

(h) means for conducting coolant liquid from said flow means through said eductor means so as to create a vacuum therein and cause said chlorine dioxide and spent reactant liquors to be withdrawn through said eductor means, so that a change of coolant liquid flow rate through the eductor induces a corresponding change in the rate of withdrawal of chlorine dioxide and spent reactant liquors from said reaction chamber.

4,618,480

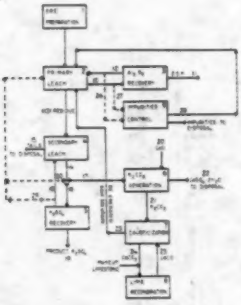
RECOVERY OF ALUMINA VALUES FROM ALUNITE ORE

Wayne W. Hazen, Denver; David L. Thompson; James E. Reynolds, both of Golden; Nicholas J. Lombardo, Boulder; Paul B. Queneau, and John P. Hager, both of Golden, all of Colo., assignors to Resource Technology Associates, Boulder, Colo.

Filed Aug. 15, 1984, Ser. No. 641,020

Int. Cl.[4] C01F 7/06

U.S. Cl. 423—127 **37 Claims**



1. A process for recovering aluminum and potassium values from alunite ore comprising:

(a) contacting said ore at a temperature above 60° C. with potassium hydroxide saturated with potassium sulfate to which no Na has been added to form a potassium sulfate-saturated primary potassium hydroxide leach liquor containing said Al values and a primary leach residue containing said K values;

(b) separating said primary leach liquor from said primary leach residue;

(c) precipitating $Al(OH)_3$ crystals from the liquor of step (b) to recover the Al values therefrom; and

(d) aqueous leaching said primary leach residue of step (b) to form a secondary leachate containing said K values.

4,618,481

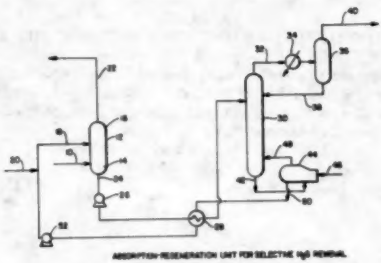
ABSORBENT COMPOSITION CONTAINING A SEVERELY HINDERED AMINO COMPOUND AND AN AMINE SALT AND PROCESS FOR THE ABSORPTION OF H_2S USING THE SAME

Fred J. Heinzelmann, Fanwood, N.J.; Noah S. Rothblatt, New York, N.Y.; James P. Glass, Jr.; Geoffrey R. Say, both of Baton Rouge, La.; George R. Chludzinski, South Orange, N.J.; Guido Sartori, and W. S. Winston Ho, both of Annandale, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 30, 1985, Ser. No. 771,515

Int. Cl.[4] C01B 17/16, 31/20; C09K 3/00

U.S. Cl. 423—228 **28 Claims**



1. An absorbent composition comprising: (1) at least one severely hindered amino compound having a cumulative $-E_s$ value (Taft's steric hindrance constant) greater than 1.75, and (2) an amine salt, said amine salt being the reaction product of an amine selected from the group consisting of a severely hindered amino compound having a cumulative $-E_s$ value greater than 1.75, a tertiary amine and mixtures thereof and a component selected from the group consisting of an acid having at least one pKa of not more than about 7, a decomposable salt of an acid having at least one pKa of not more than about 7, a compound capable of forming an acid having a pKa of not more than about 7 and mixtures thereof, said amine salt and said severely hindered amino compound being present in said absorbent composition in a mole ratio of said amine salt to said severely hindered amino compound ranging from about 0.2:1 to 4:1.

4,618,482

METHOD FOR CONTROLLING A CONCENTRATION OF SLURRY IN WET FLUE GAS DESULFURIZATION APPARATUS

Naoharu Shinoda; Atsushi Tatani; Setsuo Omoto; Susumu Okino, all of Hiroshima City, and Taku Shimizu, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1984, Ser. No. 643,456

Int. Cl.[4] C01B 17/00; C01F 1/00, 5/40, 11/46

U.S. Cl. 423—242 **5 Claims**

1. A method of controlling the concentration of slurry in an absorption tower where exhaust gas containing SO_2 is brought into contact with a slurry having a suspension of a Ca compound therein so as to absorb SO_2, said method comprising a slurry tank disposed at the lower part of said absorbing tower, a liquid chamber provided to communicate with said slurry tank and the slurry contained therein whereby the slurry is separated into at least a first and a second slurry having different concentrations of the Ca compound to form a first slurry layer having a higher concentration of the Ca compound relative to the concentration of Ca compound in said slurry tank and a second slurry layer of lower concentration of the Ca compound relative to the concentration of the Ca compound in said slurry tank, withdrawing a portion of the slurry from each of said two slurry layers and controlling the amount of slurry

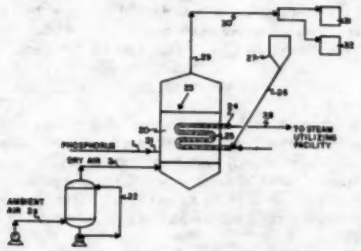
flow withdrawn and providing means for stirring the slurry in said slurry tank whereby the concentration of Ca compound in the slurry coming into contact with exhaust gas is controlled.

4,618,483

HEAT RECOVERY THROUGH OXIDATION OF ELEMENTAL PHOSPHORUS IN A FLUIDIZED BED

Howard T. Spruill, Franklin, and Thelton A. Webster, Madison, both of Tenn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 26, 1985, Ser. No. 759,201
Int. Cl.[4] C01B 25/12
U.S. Cl. 423—304 10 Claims



1. A process for the recovery of the heat values produced during the production of phosphorus pentoxide comprising:

(a) passing ambient air through drying means to produce dry air; and

(b) burning elemental phosphorus in said dry air produced in step (a) to produce hot P_2O_5-containing combustion gases said burning taking place in at least one fluid bed wherein said hot combustion gases transfer heat to the fluid bed particles, said fluid bed also having steam generating means containing circulating steam generating fluid within the fluid bed itself in intimate contact with said heated fluid bed particles.

4,618,484

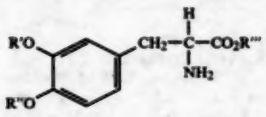
COMPOSITION AND METHOD FOR TREATMENT OF MELANOMAS

John M. Pawelek, Hamden, Conn., assignor to Yale University, New Haven, Conn.

Division of Ser. No. 480,402, Mar. 30, 1983. This application Apr. 5, 1984, Ser. No. 597,121
Int. Cl.[4] A61K 43/00, 49/00
U.S. Cl. 424—1.1 7 Claims

1. A method for the treatment of melanomas in human beings comprising the step of administering to said human a composition comprising an admixture of

(a) an effective amount of at least one O-phosphorylated derivative of DOPA of the general formula I



I

wherein R' and R" are each hydrogen or

$(R''O)_2P(O)$—

or R' and R" together represent

$(R''O)P(O)$

wherein R'' and R''' each represent hydrogen or a pharmaceutically acceptable cation and P is ^{32}P with the provizos that R' and R" cannot simultaneously be hydrogen.

4,618,485

KINETIC RADIOIMMUNOASSAY TEST METHOD AND DEVICE

Yuh-Geng Tsay, San Jose, and Vipin D. Shah, Saratoga, both of Calif., assignors to International Immunoassay Laboratories, Inc., Santa Clara, Calif.

Filed Mar. 12, 1982, Ser. No. 357,399
The portion of the term of this patent subsequent to Sep. 21, 2001, has been disclaimed.
Int. Cl.[4] G01N 33/56, 33/78
U.S. Cl. 424—1.1 17 Claims

11. A test method for the quantitative radioimmunoassay of an analyte of interest in endogenous liquid sera utilizing an immunoreagent that is specific to said analyte of interest, which immunoreagent is immobilized on a substrate, and an exogenous liquid containing radiolabeled analyte of interest, comprising the steps of:

(a) combining a measured volume of said endogenous liquid and a measured volume of said exogenous liquid with said immobilized immunoreagent in a reaction vessel and permitting an immunoreaction to occur:

(b) determing the rate of change of the quantity of radiolabeled analyte of interest which is bound to said immobilized immunoreagent at a time prior to equilibrium conditions being reached in said immunoreaction;

(c) repeating the above-described steps (a) and (b) utilizing a calibrating liquid containing a concentration of a standard amount of said analyte of interest in place of said endogenous liquid, the volume of said calibrating liquid being substantially identical to said measured volume of endogenous liquid;

(d) comparing the result of the instant test method for said endogenous liquid having an unknown concentration of said analyte of interest with said test result of the instant test method for said calibrating liquid to produce a quantitative determination of the concentration of said analyte of interest in said endogenous liquid.

4,618,486

MONOCLONAL ANTIBODY FORMULATION FOR DIAGNOSTIC USE

Karl A. Lundblad, Upsala, Sweden, assignor to MonoCarb AB, Lund, Sweden

Filed Jan. 12, 1984, Ser. No. 570,264
Claims priority, application Sweden, Jan. 21, 1983, 8300320
Int. Cl.[4] G01N 33/53, 33/577, 33/555
U.S. Cl. 424—11 9 Claims

1. A method for identifying ABO blood groups comprising contacting a member selected from the group consisting of whole red cells, red cell membranes and soluble group substances with an aqueous formulation comprising monoclonal antibodies active against cell-bound antigens of blood group A, B or AB and a soluble salt selected from the group consisting of salts of the alkali and alkaline earth metals in a concentration within the range of from 250 mmoles/liter to about 650 mmoles/liter.

4,618,487

DEVICE FOR ADMINISTERING CALCIUM ASCORBATE

Mark DuBois, Mt. View; Felix Theeuwes, Los Altos, and Patrick S. L. Wong, Hayward, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 628,677, Jul. 6, 1984, abandoned. This application Aug. 9, 1985, Ser. No. 764,027
Int. Cl.[4] A61K 9/22, 9/32, 31/365
U.S. Cl. 424—15 8 Claims

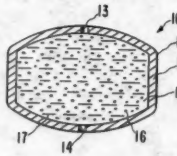
1. A dispensing device for the rate controlled delivery of the

beneficial agent calcium ascorbate to a biological environment of use, said dispensing device comprising:

(a) a wall comprising a member selected from the group consisting of a cellulose acylate and cellulose ether, which wall permits the passage of fluid present in the biological environment of use and maintains its physical and chemical integrity in the presence of calcium ascorbate, which wall also surrounds and defines:

(b) a compartment;

(c) a beneficially effective amount of calcium ascorbate in the compartment;



(d) means in the wall communicating with the compartment and the exterior of the dispensing device for delivering the calcium ascorbate to the biological environment of use; and,

(e) wherein, when the dispensing device is in operation in the biological environment of use, the dispensing device delivers the calcium ascorbate to the biological environment with a substantial decrease in irritation of the tissues of the biological environment.

4,618,488

TOOTHPASTE COMPOSITION

Tsutomu Maeyama, Chiba; Shigeru Ishii, and Kenji Kaneko, both of Tokyo, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jul. 26, 1985, Ser. No. 759,360

Claims priority, application Japan, Jul. 31, 1984, 59-162661; Sep. 7, 1984, 59-187424

Int. Cl.[4] A61K *7/16*

U.S. Cl. 424—49 **24 Claims**

1. A toothpaste composition, comprising:

an abrasive selected from the group consisting of amorphous silica, silicate and mixtures thereof having a specific surface area of 5 to 100 m^2/g as measured by the BET method with nitrogen adsorption and a specific surface area of 100 to 400 m^2/g as measured by the BET method with water vapor adsorption, said abrasive having a ratio of the specific surface area as measured by the BET method with water vapor absorption to the specific area as measured by the BET method with nitrogen adsorption of from 2 to 30.

4,618,489

DENTAL COMPOSITIONS AND METHOD OF USE THEREFOR

Jerry J. Pollock, East Setauket, and Thomas F. McNamara, Port Jefferson, both of N.Y., assignors to Research Foundation of the State University of New York, Albany, N.Y.

Filed Sep. 2, 1983, Ser. No. 529,163

Int. Cl.[4] A61K *9/16, 9/18*

U.S. Cl. 424—52 **5 Claims**

1. A method of inhibiting or reducing Streptococcus mutans colonization of carious lesions of tooth surfaces infected with cariogenic strains of *S. mutans* in substantially normal physiological concentrations in submandibular, parotide and mixed human salivas containing concentrations of bicarbonate ion of from about 1 to about 60 mM., chloride ion from about 10 to about 50 mM., and thiocyanate ion from about 0.5 to 4.5 mM., said concentrations being ineffective to kill bacteria, which comprises:

treating between one and three times a day the sites of caries lesions on said teeth with about 0.03M sodium bicarbonate by weight used in combination with about 0.03M. sodium chloride, and 0.03M. sodium thiocyanate at least until the significant reduction of *S. mutans* can be noted.

4,618,490

METHOD OF TREATMENT OF ANIMAL AND HUMAN TISSUES DAMAGED BY BURNS AND FRANK VISIBLE GANGRENE

Peter T. De Marco, 7th Ave. and Erial Rd., Pine Hill, N.J. 08021

Continuation of Ser. No. 156,915, Jun. 6, 1980, abandoned, which is a continuation of Ser. No. 919,087, Jun. 26, 1978, abandoned, which is a continuation of Ser. No. 87,621, Nov. 6, 1970, abandoned. This application Apr. 23, 1985, Ser. No. 726,062

Int. Cl.[4] A61K *31/79*

U.S. Cl. 424—80 **2 Claims**

1. A method of minimizing scarring in a patient suffering from burns which comprises administering to said patient by injection into tissues adjacent said burn injury an aqueous composition of about 50 mg. to about 2.5 g. of a pharmaceutically acceptable salt of procaine and about 100 mg. to about 5 g. of polyvinylpyrrolidone having a molecular weight of 5,000 to 50,000.

4,618,491

STABLE GEL COMPOSITION CONTAINING A CARBOXYMETHYL CELLULOSE SALT AND A PROCESS FOR THE PREPARATION OF THEM

Tetuo Kanematu, and Yoshiaki Yamaguchi, both of Himeji, Japan, assignors to Daicel Chemical Industries Ltd., Osaka, Japan

Continuation of Ser. No. 617,352, Jun. 5, 1984, abandoned. This application Oct. 31, 1985, Ser. No. 793,723

Int. Cl.[4] A61K *31/78*

U.S. Cl. 424—81 **8 Claims**

1. A stable gel composition which is prepared by a process comprising adding a water-soluble salt of carboxymethyl cellulose selected from the group consisting of sodium carboxymethyl cellulose, potassium carboxymethyl cellulose and ammonium carboxymethyl cellulose which has previously been wetted by or dispersed in a hydrophilic organic liquid selected from the group consisting of an aliphatic polyol, a lower aliphatic alcohol, an aliphatic ketone and a fatty acid ester to an aqueous solution containing a water-soluble polyvalent metal salt selected from the group consisting of an aluminum salt, an iron salt and a cupric salt, wherein the water-soluble salt of carboxymethyl cellulose and the water-soluble polyvalent metal salt are both present in amounts of 0.01–50 parts by weight per 100 parts by weight of water contained in the aqueous solution and the weight ratio of hydrophilic organic liquid to water-soluble salts of carboxymethyl cellulose is 0.2–100:1.

4,618,492

ACID-CLEAVABLE COMPOUND

Walter A. Blattler; John M. Lambert, both of Brookline, and Peter D. Senter, Jamaica Plain, all of Mass., assignors to Dana-Farber Cancer Institute, Inc., Boston, Mass.

Division of Ser. No. 645,614, Aug. 29, 1984, Pat. No. 4,542,225. This application May 13, 1985, Ser. No. 733,479

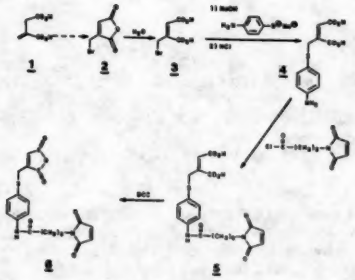
Int. Cl.[4] C07D *519/00, 521/00*

U.S. Cl. 424—85 **6 Claims**

1. A method of delivering a biologically active amino-group-containing substance selectively to members of a cell population which comprises providing an acid-cleavable complex for controlled release of a biologically active amino-group-containing substance to a liquid medium, said complex comprising

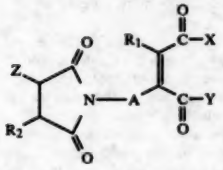
said amino-group-containing substance,

a sulfide-linked substance comprising a cell binding-partner for a cell-surface receptor, and



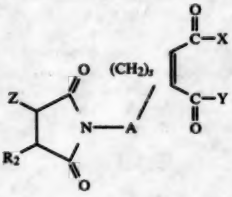
an acid cleavable linker between the sulfide-linked substance and the amino-group-containing substance, said complex comprising one of the two following units:

(1)



where: one of X and Y is 0^-; the other of X and Y is the residue of the amino-group-containing substance whose amino nitrogen forms an amide link with a crbonyl group of the maleic acid function; Z is the sulfide-linked substance, including the sulfur of that link; R_1 and R_2 are independently selected from H and alkyl groups of C_5 or less; and A is a bridge unit; and

(2)



where X, Y, Z, R_2, and A are as defined above, and s=2-5, and

exposing the cells to said complex, whereby the complex is exposed to a pH low enough to hydrolyze the amide bond between the nitrogen of an amino group of the amino-group-containing substance and a carbonyl group of the maleic acid function of the cross-linked complex.

4,618,493

TEMPERATURE SENSITIVE STRAINS OF BOVINE VIRAL DIARRHOEA VIRUS, PREPARATION THEREOF AND VACCINES CONTAINING THEM

Jean-Claude Delgoffe, Bierges; Michèle Lobmann, Rosieres, and Nathan Zygraich, Brussels, all of Belgium, assignors to Smith-Kline-RIT, Belgium

Filed Oct. 13, 1982, Ser. No. 434,155
Int. Cl.[4] A61K *39/12*; C12N *7/06*
U.S. Cl. 424—89 **17 Claims**

1. A live bovine viral diarrhoea (BVD) virus vaccine capable of inducing immunity in bovines comprising an effective amount to induce immunity of at least $10^{3.5}$ $TCID_{50}$ of a temperature sensitive (ts) mutant of BVD virus wherein the ts mutant is obtained by mutagenesis with nitrous acid and wherein the mutant shows a replication ability considerably limited at the animal body temperature, 39.5° C., and shows a difference of infectious titer of about 3 log 10 $TCID_{50}$ between 35° C. and 39.5° C.

3. A vaccine according to claim 1 or 2 further comprising at least one live bovine respiratory virus vaccine.

7. A vaccine according to claim 1 or 2 wherein the ts mutant is the BVD virus strain C.N.C.M. I-199.

4,618,494

HUMAN IMMUNE FACTORS AND PROCESSES FOR THEIR PRODUCTION AND USE

John W. Angers, Red Bank, N.J., assignor to Immunology Development Corporation, Red Bank, N.J.

Filed Jul. 20, 1984, Ser. No. 632,705
Int. Cl.[4] A61K *35/14*
U.S. Cl. 424—101 **37 Claims**

1. A process for the preparation of a pharmaceutical composition for treating virus-induced and autoimmune diseases which comprises:

a. removal of a blood sample from a donor,

b. treatment of the blood sample with at least one effective activator selected from the group of interferons, bacterial antigens or both, to form an activated blood mixture,

c. incubation of the activated blood mixture for a period sufficient for blood cells in the blood mixture to secrete extracts,

d. purification of the extracts from the activated blood mixture by isolation of compounds in the activated blood mixture with molecular weights in the range from about 1,000 to about 25,000 daltons.

4,618,495

PREPARATION FOR REDUCING CANCER SYMPTOMS WITHOUT TREATING CANCER

Hiromichi Okuda, Matsuyama; Hiroshi Masuno, Ehime; Masaki Aburada; Shigefumi Takeda, both of Kawasaki; Eiko Itoh, Nagareyama; Moe Matsushita, Machida, and Eikichi Hosoya, Tokyo, all of Japan, assignors to Tsumura Juntendo Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 509,200, Jun. 29, 1983, abandoned. This application Feb. 14, 1985, Ser. No. 701,458
Claims priority, application Japan, Aug. 25, 1982, 57-146143
Int. Cl.[4] A61K *35/78*
U.S. Cl. 424—195.1 **4 Claims**

1. A composition useful in inhibiting promotion of adipose degradation and anorexia, comprising an effective amount to inhibit promotion of adipose degradation and anorexia of an aqueous extract of a mixed crude preparation consisting of two parts by weight of each of Astragali radix, Cinnamomi cortex, Rehmanniae radix, Paeoniae radix, Cnidii rhizoma, Atractylodis lanceae rhizoma, Angelicae radix, Ginseng radix and Hoelen, and one part by weight of Glycyrrhizae radix.

4,618,496

ANTIMICROBIAL PEAT MOSS COMPOSITION

Raynald Brasseur, Montreal, Canada, assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jul. 16, 1984, Ser. No. 631,271
Int. Cl.[4] A01N 65/00
U.S. Cl. 424—195.1 4 Claims

1. A process for providing a composition for inhibiting the growth of microorganisms comprising:

soaking peat moss in a solution comprising from 0.01 to 5.0 percent, by weight of an antimicrobial heterocyclic compound;

removing excess solution and

washing said treated peat moss to remove non-substantively bound heterocyclic compound while retaining at least five mg of substantively bound heterocyclic compound per gram of peat moss.

4,618,497

QUARANTINE SYSTEM FOR PAPAYA

H. Melvin Couey, Hilo, and Charles F. Hayes, Kailua, both of Hi., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C. and The University of Hawaii, Honolulu, Hi.

Filed Jul. 22, 1985, Ser. No. 757,396
Int. Cl.[4] A23L 1/212
U.S. Cl. 426—233 7 Claims

1. A quarantine method for papaya, a selection process and disinfestation treatment method, which comprises:

(a) measuring the color of papaya on a Hunter Colorimeter and rejecting papaya which have either a blossom end Hunter b value greater than 27.4 or a yellow spot Hunter b value greater than 30.5;

(b) heating the papaya to be treated in a fluid at 38° to 45° C. (T_1) for about 30 to 60 minutes (t_1); and

(c) heating the papaya from step (b) in a fluid at 45° to 55° C. (T_2) for about 5 to 30 minutes (t_2);

said time between heating steps (b) and (c) does not exceed 3 minutes;

said temperature of step (b) is lower than the temperature of step (c);

said time of step (b) is equal to or greater than the time of step (c); and

wherein three of the values of T_1, t_1, T_2, and t_2 are specified and the fourth value is determined from the equation:

$$S = \sum_j s_j P_j$$

wherein S is the overall survival rate of infestation in papaya which is determined by the mortality of fruit flies required; P_j is the probability for the occurrence of a fruit fly egg at depth j, and s_j is the survival of a fruit fly egg at depth j and is determined from the equation:

$$\log s_j = \sum_i \log s_{ij} = \sum_i -\exp(AT_{ij} - B)t_{ij}$$

where A=0.554/°C.; B=26.8; and where T_{ij} is determined from the equation:

$$T = T_o - \frac{2T_o}{R} \sum_{n=1} \frac{\exp(-k\alpha_n^2 t) J_o(r\alpha_n)}{\alpha_n J_1(R\alpha_n)} + \frac{2}{R^2} \sum_{n=1} \frac{\exp(-k\alpha_n^2 t) J_o(r\alpha_n)}{J_1^2(R\alpha_n)} \int_0^R \eta f(r) J_o(r\alpha_n) dr$$

where T_o is the fluid temperature; t is the length of time of heating; r is the distance from the center to the desired position in the fruit; k is 1.52×10^{-3} cm^2/s; $J_o(\,)$ is a zero order Bessel function of the first kind; $J_1(\,)$ is a zero order Bessel function of the second kind; α_n is determined from the equation:

$$J_o(R\alpha_n) = 0$$

and R is determined from the equation:

$$\text{density} = \text{average fruit mass}/\pi R^2 L$$

where L is the average fruit length from the blossom to stem end.

4,618,498

PROCESS FOR PRODUCING LATTICED PASTRY PRODUCTS

Robert R. Thulin, Wyckoff, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 11, 1985, Ser. No. 743,380
Int. Cl.[4] A23P 1/08
U.S. Cl. 426—275 15 Claims

1. The process of continuously forming individual product pieces having filler therein and having perforations of substantial size in the top layer thereof, comprising:

(a) forming a first continuous flat dough sheet;

(b) transporting the first continuous flat dough sheet on a first conveyor belt;

(c) periodically depositing at least one portion of a natural filler or an artificial filler on the first continuous flat dough sheet;

(d) forming a second continuous flat dough sheet;

(e) transporting the second continuous flat dough sheet on a second conveyor belt of a material to which the dough of the second continuous flat dough sheet will adhere in response to pressure, the second conveyor belt being positioned above the first conveyor belt along the axis of movement of the first conveyor belt after the at least one filler depositor (c);

(f) moving cutting elements through the second continuous flat dough sheet to form a multitude of holes in the second continuous flat dough sheet, each such hole containing a dough piece therein, the cutting elements pressing the perimeter of each dough piece so that the perimeter of each dough piece adheres to the second conveyor belt;

(g) lifting the second continuous flat dough sheet off of the second conveyor belt by means of a third conveyor belt without disturbing the cut out dough pieces, adhered to the second conveyor belt, thereby providing perforations in the second continuous flat dough sheet, the third conveyor belt being positioned above the end portion of the second conveyor belt along the axis of movement of the second conveyor belt and above the first conveyor belt;

(h) placing the perforated, second continuous flat dough sheet on top of the first continuous flat dough sheet and deposits of filler thereon, thereby forming a continuous composite comprising the filler deposits enclosed between the perforated, second continuous dough sheet and the first continuous flat dough sheet; and

(i) dividing the continuous composite into individual pieces, each individual piece having at least one deposit of filler enclosed between a segment of the perforated, second dough sheet and a segment of the first flat dough sheet, the filler showing through the perforations in the segments of the second dough sheet.

4,618,499

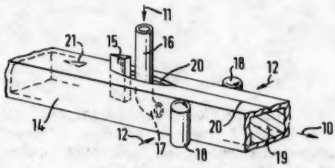
METHODS FOR MAKING FILLED EXTRUDED FOOD PRODUCTS

Andrew R. Wainwright, Reading, England, assignor to United Biscuits (UK) Limited, Edinburgh, Scotland

Filed Feb. 14, 1985, Ser. No. 701,684
Int. Cl.[4] A21D 13/08
U.S. Cl. 426—283 5 Claims

4. A method of making a filled extruded food product,

which comprises extruding a unitary tubular casing of food stuff having a cross-sectional shape of closed-loop form as extruded, slitting the tubular casing to form a single longitudinal opening through a wall thereof, filling the interior of the slit casing through said opening with a food stuff, and closing the opening over the filling by bringing into contact with each other the edges of the opening formed by slitting.



4,618,500

METHOD FOR PREPARING AN ESPRESSO-TYPE COFFEE BEVERAGE

Richard Forquer, Glendale, Calif., assignor to Fulcrum Enterprises, Cayman Islands

Filed Aug. 20, 1985, Ser. No. 767,486
Int. Cl.[4] A23F *5/24*
U.S. Cl. 426—433 **11 Claims**

1. A method for preparing an espresso-type coffee beverage having an appearance, flavor, texture and aroma like that of freshly-brewed espresso coffee, comprising the steps of:

pouring a substantially froth-free aqueous solution of water-soluable extract of espresso coffee containing between about 3–4% solutes and having a temperature between about the freezing point of said solution and ambient temperature into an open-topped, heat resistant preparation vessel in an amount sufficient to make the number of servings desired;

injecting steam into said solution in a region near the bottom of said solution in said vessel at a temperature and velocity sufficient to heat said solution to the serving temperature desired without boiling or substantially diluting said solution with water condensed from said steam, and at region near the top of said solution to form a froth on top of said aqueous solution which is substantially identical to the froth on freshly-brewed espresso coffee; and

dispensing said heated, frothed solution into individual serving cups for immediate serving, each said cup containing a portion of said froth.

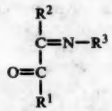
4,618,501

FLAVORING WITH α, β-KETO-IMINES

Thomas H. Parliment, New City, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed May 28, 1985, Ser. No. 737,852
Int. Cl.[4] A23L *1/226*
U.S. Cl. 426—534 **10 Claims**

1. A composition comprising a foodstuff and a flavoring compound in an amount to impart a cereal, nutty corn character wherein said compound has a structure selected from the group of α,βKeto-imines consisting of:



wherein

R^1 is a saturated or unsaturated alkyl straight or branched chain hydrocarbon having from C_1 to C_3 carbon atoms;

R^2 is a saturated or unsaturated alkyl straight or branched chain hydrocarbon having from C_1 to C_3 carbon atoms;

R^3 is a saturated or unsaturated alkyl straight or branched chain hydrocarbon having from C_1 to C_3 carbon atoms.

4,618,502

PROCESS FOR CONVERTING CASEIN TO CASEINATE

Marvin F. Beach, 2899 Arthington Blvd.-P.O. Box 18298, Indianapolis, Ind. 46218

Filed Aug. 8, 1984, Ser. No. 638,979
Int. Cl.[4] A23C *21/06*
U.S. Cl. 426—583 **7 Claims**

1. A process for converting casein to caseinate, comprising the steps of

pretreating a concentrated whey solution by heating to a temperature of 140° F. and adjusting the pH of said preheated solution to above about 8 to provide a pretreated wey solution;

blending neutralized casein with the pretreated whey solution at temperatures up to about 190° F., thereby producing a mixture having a pH above 6.5 thus producing a blend comprising by weight between 40% and 90% whey solids and between about 10% and 60% casein solids;

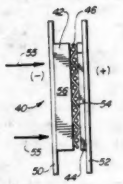
thereby converting said blend to caseinate.

4,618,503

METHOD OF FORMING A REACTIVE METAL ANODE HAVING AN EDGE SEAL

Arnold Z. Gordon, Lyndhurst, Ohio; Jerry L. Morris, San Jose, and Gary E. Mason, Sunnyvale, both of Calif., assignors to Gould, Inc., Rolling Meadows, Ill.

Filed Mar. 14, 1985, Ser. No. 711,492
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—11 **16 Claims**



1. A method of forming a sealed reactive metal anode useful in an electrochemical cell comprising said anode, a cathode and an electrolyte in which said anode and cathode are in operation during operation of said cell, said method comprising the steps of:

(a) providing an anode of said reactive metal, said anode defining a first surface which contacts said electrolyte and at least one additional surface at the perimeter of at least a portion of said first surface; and,

(b) coating said additional surface with a hydrophobic polymer which is substantially chemically inert with respect to said reactive metal and said electrolyte and wherein:

(i) the ratio of the flexural modulus to the flexural strength of said polymer is at least about 25;

(ii) the Izod impact value of said polymer is less than or equal to about 2.0 ft.-lb./in.; and,

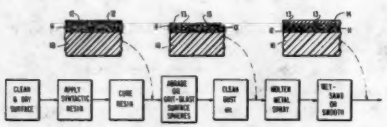
(iii) the percent elongation of said polymer is less than or equal to about 20%, said first surface being substantially free of said hydrophobic polymer, and said coating step (b) being carried out in an atmosphere which is non-reactive with respect to said reactive metal.

4,618,504

METHOD AND APPARATUS FOR APPLYING METAL CLADDING ON SURFACES AND PRODUCTS FORMED THEREBY

Alexander A. Bosna, 814 Washington St., Cape May, N.J. 08204, and Louis M. Riccio, 6 Hollow Rd., Malvern, Pa. 19355

Division of Ser. No. 563,430, Dec. 20, 1983, Pat. No. 4,521,475, which is a continuation-in-part of Ser. No. 481,412, Apr. 1, 1983.
This application Feb. 28, 1985, Ser. No. 706,989
Int. Cl.[4] B05D *1/08, 3/06*
U.S. Cl. 427—34 24 Claims



1. In a method of applying a metal coating to a marine surface of a metal selected from the group comprising copper and copper alloys, the improvement comprising the steps (1) of grit-blasting said marine surface, (2) coating said marine surface with a curable syntactic foam adhesive layer, (3) curing said curable adhesive layer, (4) abrading said cured syntactic foam adhesive layer to expose any voids in said cured syntactic foam adhesive layer and thereby produce undercuts, nooks and crannies in the surface thereof, and (5) thermally spraying the undercuts, nooks and crannies in said syntactic foam adhesive layer with molten particles of said metal in one or more passes thereof.

4,618,505

METHOD OF MAKING ADHERENT SCORE-RESISTANT COATING FOR METALS

Bernard A. MacIver, Lathrup Village; James C. Erskine, Jr., Birmingham, and John C. Bierlein, Washington, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 674,239, Nov. 23, 1984, Pat. No. 4,554,208.
This application Aug. 19, 1985, Ser. No. 766,449
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—38 1 Claim

1. A method of making an adherent coating on a bearing surface of an iron based alloy member having a surface roughness average of less than about 8 microinches, which coating exhibits high lubricity and score resistance when in sliding contact with an aluminum based alloy surface, the method comprising:

applying a coating about 0.5–1.0 micrometer thick of a sulfur-free, methacrylate-type of resist to a bearing surface of an iron based alloy member;

initially implanting ions into the coated surface at an energy greater than about 180 keV at a rate greater than about 2 microamperes per square centimeter and at a dosage of about 1×10^{15}–1×10^{16} ions per square centimeter, wherein the ions are of a substance of gaseous atmospheric pressure or which can chemically bond to carbon or iron, and have sufficient energy to completely penetrate the resist coating, and are implanted in sufficient dosage to reduce coating thickness to about one-half to one-fourth of the initial coating thickness; and

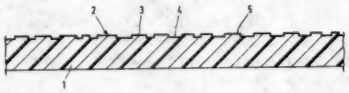
subsequently implanting ions into the coated surface at an energy of about 100–150 keV at a rate of at least about 2 microamperes per square centimeter at a dosage of about 1×10^{15}–1×10^{16} ions per square centimeter, wherein the energy is tailored to provide maximum damage to existing chemical bonds to occur and thereby allow carbon-to-metal bonds to form at the interface between the bearing surface and the coating, effective to produce a coating containing graphite-like and diamond-like crystalline microstructures and initially bond the coating to the iron based alloy bearing surface.

4,618,506

METHOD OF PROVIDING A METAL MIRROR

James S. Temple; Petrus E. J. Legierse, and Theodorus H. G. Martens, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 9, 1984, Ser. No. 587,793
Claims priority, application Netherlands, Dec. 27, 1983, 8304443
Int. Cl.[4] B05D *1/00, 3/00, 5/06*
U.S. Cl. 427—40 6 Claims



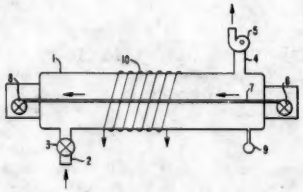
1. A method of providing an adhering metal layer on a surface of polycarbonate, characterized in that the surface is treated with an aminosilane, that the treatment with aminosilane is preceded by a corona discharge applied to the surface and/or is succeeded by a treatment of the surface with tannin, and that finally a metal mirror is provided according to a known electroless chemical metallization process.

4,618,507

METHOD OF MAKING A CAPACITOR WINDING

Rajender K. Sadhir, Plum, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 7, 1985, Ser. No. 731,258
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—41 17 Claims



1. A method of depositing conducting and polymeric films on a substrate comprising:

(A) exposing a plasma polymerizable vapor, selected from the group consisting of organometallic compounds and mixtures thereof with inert carrier gas, to a plasma; and

(B) moving a substrate, which is in the form of a film, beneath said plasma-exposed polymerizable organometallic vapor at a speed such that the metallic element in said organometallic vapor is deposited on said substrate as a conducting film, and carbon from said organic portion of said organometallic vapor is deposited on said conducting film as a pinhole-free highly-cross-linked polymeric film.

4,618,508

PROCESS FOR PRODUCING COMPOSITE LAYERS

Gerard Blandenet, Meylan; Jean-Jacques Chazee, Grenoble, and Michel Court, Echirolles, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

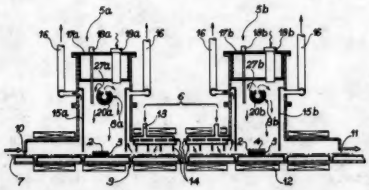
PCT No. PCT/FR84/00073, § 371 Date Nov. 21, 1984, § 102(e) Date Nov. 21, 1984, PCT Pub. No. WO84/03720, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 21, 1983, Ser. No. 682,352

Claims priority, application France, Mar. 21, 1983, 83 04565

Int. Cl.[4] B05D *3/12*

U.S. Cl. 427—57 3 Claims



1. Process for producing conductive composite layers constituted by a first layer (2) and a second layer (4), produced from chemical compounds, the layers being superimposed, this process consisting of depositing the first layer (2) on a substrate (3) and then the second layer (4) on the first layer (2), the first layer (2) being formed from tin-doped indium oxide, the second layer (4) being formed from tin oxide doped with one of the two elements fluorine or antimony, wherein the second layer is deposited immediately after the first and the depositions of the layers are carried out by reactive chemical spraying and at temperatures determined by the compounds to be deposited, a chemically inert atmosphere being maintained between each deposition, so that said first layer has an electrical resistivity at the most equal to 2.5×10^{-4} Ω-cm, without heat treatment.

4,618,509

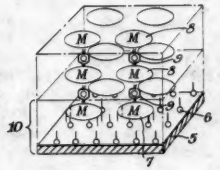
ARRAYS OF STACKED METAL COORDINATION COMPOUNDS

John E. Bulkowski, Newark, Del., assignor to University of Delaware, Newark, Del.

Division of Ser. No. 246,648, Mar. 23, 1981, abandoned. This application May 29, 1984, Ser. No. 614,894

Int. Cl.[4] C23C *18/00, 28/00;* H01L *27/14*

U.S. Cl. 427—74 9 Claims



1. The process of assembling an array having utility in photosensitive elements comprising contacting a first monolayer of a metal coordination compound, said first monolayer characterized by a linking agent attached to the metal atom of the compound, with a water solution of a second metal coordination compound thereby causing the assembly of a second metal monolayer on said first monolayer, said linking agent forming thereby an interlayer linkage between metal atoms of the first monolayer and the second monolayer whereby to cause said layers to assume an interlayer orientation wherein the metal atoms are a stacked one above the other.

4,618,510

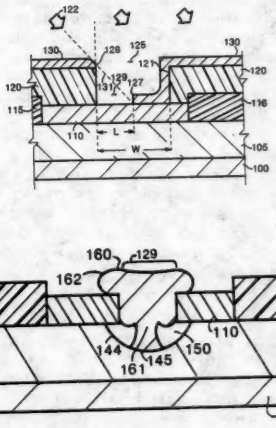
PRE-PASSIVATED SUB-MICROMETER GATE ELECTRODES FOR MESFET DEVICES

Tun S. Tan, Santa Rosa, Calif., assignor to Hewlett Packard Company, Palo Alto, Calif.

Filed Sep. 5, 1984, Ser. No. 634,250

Int. Cl.[4] H01L *21/285*

U.S. Cl. 427—89 8 Claims



1. A method for producing a device in a semiconductor wafer comprising the steps of:

forming a dielectric layer over a first region of a surface of the semiconductor wafer;

forming a first and second contact on second and third regions of the wafer surface, the first and second contacts being separated by the dielectric layer;

forming a first coating layer over the first and second contacts and the dielectric layer between the contacts, the first coating having an opening over a first region of the dielectric layer, thereby leaving an exposed area of the dielectric layer;

forming a first metal layer over the first coating layer and a portion of the dielectric layer by angle evaporation;

removing the dielectric layer in the exposed area, thereby exposing a surface region of the wafer;

forming a trough region in the exposed surface region of the wafer; and

depositing a second metal layer on a portion of the wafer in the trough region.

4,618,511

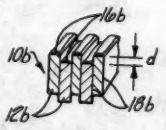
METHOD FOR APPLYING NON-SKID COATING TO METAL BARS WITH ELECTRIC ARC OR GAS FLAME SPRAY AND ARTICLE FORMED THEREBY

William S. Molnar, 3565 Roland Dr., Birmingham, Mich. 48010

Filed May 31, 1985, Ser. No. 739,692

Int. Cl.[4] B05D *1/08*

U.S. Cl. 427—203 30 Claims



1. A process for forming metal bars with non-skid coating on

the narrow end surfaces of the metal bars comprising the steps of

providing a plurality of longitudinally extending metal bars each having side surfaces and a top end surface to be coated, with said end surface having a thickness in a range of between around ¼" to around 1",

processing said end surfaces to provide a clean, roughened surface finish,

arranging said metal bars in an assembly having an overall width of between around 24" to around 48" with said bars being oriented in a side by side relationhip with each of said end surfaces being exposed in the same direction,

said bars as assembled having adjacent ones of said end surfaces spaced from each other a distance of between around 0.07" to around 0.20",

applying a first metallic coat on said end surfaces by a first thermal spray,

applying a coat of grit onto said first metallic coat while said first metallic coat is still in a thermally plastic state whereby said grit will adhere to said first metallic coat,

applying a second metallic coat by a second thermal spray over said grit coat and said first metallic coat, and

fabricating the resultant coated bars into a finished product.

4,618,512

PROCESS TO IMPART SMOOTH-DRY AND FLAME RETARDANT PROPERTIES TO SYNTHETIC-CELLULOSIC BLENDED FABRICS

Robert J. Harper, Jr., Metairie, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 586,617, Mar. 6, 1984, Pat. No. 4,536,422. This application Jun. 28, 1985, Ser. No. 749,905

The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.

Int. Cl.⁴ B05D *3/02*; D06M *13/34*

U.S. Cl. 427—381 **16 Claims**

1. A process for imparting smooth-dry and flame retardant properties to synthetic-cellulose blend fabrics comprising:

(a) padding a synthetic-cellulosic blend fabric, said fabric containing a minimum of 50% cellulose with a solution comprising sufficient amounts of N-methylol crosslinking agent, an acid catalyst, a halogen containing alcohol, and antimony oxide to produce smooth-dry, flame retardant properties in the blend fabric;

(b) drying said cellulosic-blend fabric for sufficient time and at sufficient temperature to drive off the moisture; and then;

(c) curing said blend fabric for sufficient time and temperature to impart smooth-dry, flame retardant properties to said blend fabric.

4,618,513

TIN PLATING IMMERSION PROCESS

Edmund W. Kinkelaar, Dublin, and Howard G. Pekar, Columbus, both of Ohio, assignors to Texo Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 682,749, Dec. 17, 1984, Pat. No. 4,550,037. This application Oct. 24, 1985, Ser. No. 790,736

The portion of the term of this patent subsequent to Oct. 29, 2002, has been disclaimed.

Int. Cl.⁴ B05D *1/18*

U.S. Cl. 427—443.1 **11 Claims**

1. In a method for coating an electro-conductive substrate with tin, the steps of (1) immersing the substrate to be coated and one or more pieces of metallic zinc in a bath having the following composition:

(a) approximately 3 to 70 grams of stannous ions per liter of water;

(b) approximately 10 to 200 grams of a strong mineral acid per liter of water, the concentration of said acid being sufficient to maintain the stannous ions in solution in the bath; and

(c) 0.1 to 10 grams of a surface active agent which functionally controls the rate of desposition of stannous ion in an acid bath environment to obtain an adherent, non-porous tin coat on the substrate;

(2) effecting electro-conductive contact between the substrate to be coated and the metallic zinc immersed in said bath for a pre-determined length of time related to the thickness of the tin coating to be deposited on the substrate; (3) operating said bath at a temperature between approximately 50 to 110 degrees F.; (4) removing the substrate coated with tin from the bath.

4,618,514

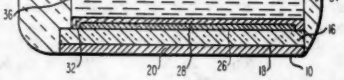
ALIGNMENT LAYER FOR LIQUID CRYSTAL DISPLAY

Sandra K. McClelland, Bordentown Township, Burlington County, and Eugene S. Poliniak, Willingboro Township, Burlington County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 20, 1985, Ser. No. 811,877

Int. Cl.⁴ C09K *3/34*

U.S. Cl. 428—1 **7 Claims**



1. In a liquid crystal display device comprising a layer of liquid crystal material sealed between two substrates which have electrodes formed thereon, the opposing inner surfaces of the substrates being covered with an alignment layer, the improvement wherein the alignment layer comprises an optically clear, alkali-soluble resin which is an addition product of at least one ethylenically unsaturated, ligand-free monomer and at least one ethylenically unsaturated monomer having at least one carboxyl group.

4,618,515

POLYESTER CONTAINER WITH ORIENTED, CRYSTALLIZED THREAD FINISH FOR HOT FILL APPLICATIONS AND METHOD OF MAKING SAME

Wayne N. Collette, and Donald R. Demanche, both of Merrimack, N.H., assignors to Continental PET Technologies, Inc., Stamford, Conn.

Filed Apr. 5, 1985, Ser. No. 720,504

Int. Cl.⁴ B29C *17/07*

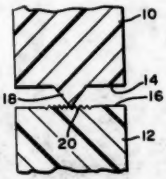
U.S. Cl. 428—35 **18 Claims**

1. A polyester container comprising a body terminating in a large diameter mouth, said mouth having a diameter generally approaching the diameter of said body, said mouth being defined by a neck finish of the type for releasably receiving a closure, said neck finish being biaxially oriented, and said neck finish having a greater density than said body to provide a diameter reduction when the container is hot filled that is materially less than that of said body.

4,618,516
ULTRASONIC WELDING OF THERMOPLASTIC WORKPIECES

Thomas B. Sager, Newtown, Conn., assignor to Branson Ultrasonics Corporation, Danbury, Conn.

Filed Sep. 12, 1985, Ser. No. 775,343
Int. Cl.[4] B29C *65/08*
U.S. Cl. 428—35 4 Claims



3. An article of manufacture formed by:

positioning two thermoplastic workpieces in juxtaposed, stacked relationship with one another along confronting surfaces, one of said surfaces having an energy director extending from such surface for contacting the confronting surface of the other workpiece, the confronting surface of such other workpiece being of a rough texture;

applying a compressive force to said workpieces for urging said confronting surfaces into contact with one another;

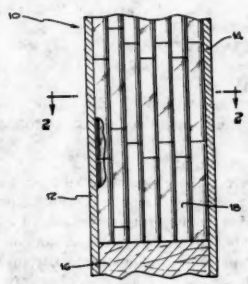
applying ultrasonic vibratory energy to said workpieces to cause softening of the thermoplastic material of said energy director and the material on said other workpiece surface contacted by said energy director for providing molten thermoplastic material at the interface between said workpieces, and

ceasing the application of ultrasonic energy while briefly maintaining said workpieces under a compressive force for causing said molten thermoplastic material to rigidify and form a weld.

4,618,517
THERMAL INSULATING MATERIAL

Frank A. Simko, Jr., 5666 Cope Leyte Dr., Sarasota, Fla. 33580

Continuation of Ser. No. 767,059, Aug. 19, 1985, abandoned, which is a continuation of Ser. No. 626,016, Jun. 29, 1984, abandoned. This application Apr. 8, 1986, Ser. No. 850,426
Int. Cl.[4] B32B *1/08, 3/26*
U.S. Cl. 428—36 12 Claims

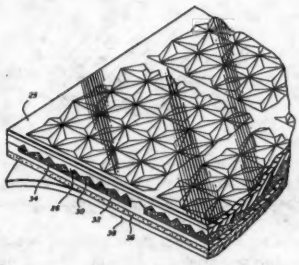


1. A thermal insulating material comprising at least two layers of thin-walled, hollow tubes arranged such that the longitudinal axes of the tubes are perpendicular to the direction of heat flow, each layer having at least two rows of such tubes, and each tube having a length-to-diameter ratio of at least about 1.5 to about 10 and a diameter-to-wall thickness ratio of at least about 50 to 150.

4,618,518
RETROREFLECTIVE SHEETING AND METHODS FOR MAKING SAME

Robert M. Pricone, Vernon Hills; William N. Roberts, Niles, and Richard Zanotti, Hoffman Estates, all of Ill., assignors to Amerace Corporation, Hackettstown, N.J.

Continuation-in-part of Ser. No. 640,009, Aug. 10, 1984, abandoned, which is a continuation-in-part of Ser. No. 533,068, Sep. 19, 1983, abandoned. This application Jun. 20, 1985, Ser. No. 747,103
Int. Cl.[4] D06N *7/00;* B32B *3/00*
U.S. Cl. 428—40 67 Claims



1. A flexible retroreflective cube corner type laminate sheet construction including a thermoplastic web with a light-receiving and transmitting first side and a second side coextensive with said first side, and a cube corner type retroreflective pattern formed on at least a portion of said second side, said construction comprising:

a layer of hydrophobic granular material deposited on said second side to cover selected portions of said formed cube corner retroreflective pattern with remaining portions of said second side devoid of said hydrophobic granular material; and

a layer of backcoating material deposited on said second side to substantially completely overly said hydrophobic granular material without disturbing the pattern formed by said granular material, said backcoating material substantially fully contacting said portions of said second side devoid of said granular material and being fixedly secured thereto, thereby encapsulating said hydrophobic granular material between said second side and said backcoating layer, the particle size of said hydrophobic granular material being such that the area in which it is deposited will be effectively impervious to said backcoating material whereby said backcoating material is unable to penetrate said granular material and interact with said second side except in the area devoid of said granular material.

4,618,519
TIRE REPAIR BY "PATCH ONLY" METHOD

Russell W. Koch, Hartville, Ohio, and Douglas D. Snyder, Tempe, Ariz., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 584,426, Feb. 28, 1984, abandoned. This application Apr. 1, 1985, Ser. No. 718,666
Int. Cl.[4] B32B *3/26*
U.S. Cl. 428—63 7 Claims

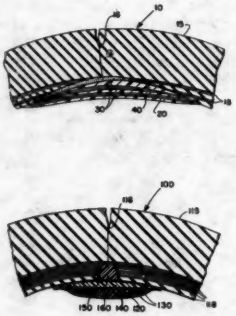
1. A repaired elastomer article, consisting essentially of the elastomer article, said article having a crack/cut extending therethrough;

said article having a reinforcement area, said article having a cavity formed in the interior vicinity of said crack/cut,

said cavity interiorly extending inclusively into said reinforcement area;

a filler, said filler residing in said interior cavity;

a treating agent, said treating agent residing at least on the interior portion of said elastomer article surrounding said filler;



an amine curable polymer or prepolymer, said amine curable polymer or prepolymer residing on said treating agent;

a cured elastomeric patch, said patch residing on said amine curable polymer or prepolymer;

said amine curable polymer or prepolymer bonded to said patch and to said article at ambient temperature.

4,618,520

PREFABRICATED BINDABLE SHEET

Albert E. Holmberg, Edina, Minn., assignor to The Holmberg Company, Minneapolis, Minn.

Filed Feb. 27, 1984, Ser. No. 584,169

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.⁴ B32B *3/10*

U.S. Cl. 428—131 **1 Claim**

1. A prefabricated bindable sheet comprising,

a sheet of paper having a marginal recess formed along one edge thereof,

a substantially continuous strip of heat-responsive glue applied to said paper in said recess of a thickness no greater than the depth of the recess to produce a prefabricated bindable sheet of substantially uniform thickness throughout its entire surface area,

and a plurality of spaced-apart openings formed in the recessed portion of said sheet and extending therethrough so that the heat-responsive glue applied in said recess extends through the thickness of the sheet and is exposed on the opposite side of the sheet from the recess to produce glue-to-glue binding when two sheets are heat-sealed together.

4,618,521

CORROSION PROTECTION SHEET

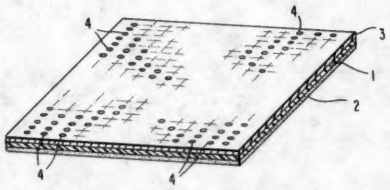
Karl Rühl, Bad Nauheim, and Karlheinz Bildner, Rodenbach, both of Fed. Rep. of Germany, assignors to Rütgerswerke Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,751

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1984, 3403407

Int. Cl.⁴ B32B *11/02, 3/10*

U.S. Cl. 428—137 **6 Claims**



1. A corrosion protective sheet provided with perforations for the application by melting to steel surfaces at a temperature of 120° to 160° C. within 30 minutes which has a resistance to temperature in a range of −40° to 160° C. comprising a mixture of 60 to 90 weight percent bitumen, 0.5 to 7 weight percent SBR-rubber, 5 to 25 weight percent elastomeric modified bitumen, 0.5 to 7.5 weight percent natural resin and 0.5 to 10 weight percent of an organic or inorganic fibrous material which is resistant to a temperature of up to 160° C., and provided on the underside with a meltable adhesive (2) which exists as a solid sheet at a temperature under 90° C. and has a melting temperature between 120° and 160° C. and which is resistant to bitumen and having on the upper side a bitumen resistant anti-block material (3) which also is solid at a temperature under 90° C.

4,618,522

ORGANOSILOXANE FABRIC COATING COMPOSITIONS

Frank J. Modic, Scotia, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,800

Int. Cl.⁴ B32B *5/02*

U.S. Cl. 428—145 **22 Claims**

16. An article useful as a roofing fabric membrane structure having improved tear strength and flame retardance comprising:

(a) a base fabric material;

(b) an addition curable elastomeric silicone base coating composition having an effective amount of non-abrasive filler selected from the group consisting of calcium carbonate, hydrated alumina, fumed silica, aluminum silicate, potassium titanate, zirconium silicate, carbon black, zinc oxide, titanium dioxide, ferric oxide, silica aerogel, precipitated silica, calcium silicate, chromic oxide, cadmium sulfide, lithopone, talc, magnesium oxide and graphite, and mixtures thereof applied to at least one side of said base fabric material; and

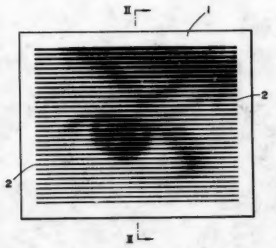
(c) a coating composition which is resistant to dirt pickup on at least onse side of said base fabric material.

4,618,523

FORMING A SIMULATED HALFTONE PICTURE

Masao Yoshida, Tokyo, Japan, assignor to Kabushiki Gaisha Waizen, Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,432
Claims priority, application Japan, Oct. 5, 1984, 59-209456
Int. Cl.[4] B32B 3/14
U.S. Cl. 428—189 3 Claims



1. A poster comprising: a base member and a plurality of strips of various widths and of a color different from the color of said base sheet, said strips being arranged parallel to each other at a regular interval distance between the longitudinal center lines of adjacent strips, and being applied to the surface of said base member with an adhesive agent, the widths of said strips varying with the values in the light or dark tones in a picture or pattern to be reproduced, thus showing varying shades by stripes, and producing a desired halftone-like image on the background of said base member.

4,618,524

MICROPOROUS MULTILAYER NONWOVEN MATERIAL FOR MEDICAL APPLICATIONS

Dieter Groitzsch, Hirschberg, and Erich Fahrbach, Weinheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Sep. 17, 1985, Ser. No. 776,811
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 3437183
Int. Cl.[4] B32B 27/14
U.S. Cl. 428—198 13 Claims

1. A microporous, multilayer nonwoven material, comprising:

a layer of nonwoven, microfiber material having a weight of from about 0.5 to about 60 g/m^2, each microfiber thereof being hydrophobic and having a diameter of from about 0.1 to about 10 microns;

nonwoven layers covering opposite sides of the microfiber layer; and

water-repellent paste members penetrating through the layers in a pattern across the layers sufficient for bonding the layers together.

4,618,525

COATED GLASS MICROBUBBLES AND ARTICLE INCORPORATING THEM

Craig S. Chamberlain, Woodbury; George F. Vesley, Hudson; Patrick G. Zimmerman, St. Paul, and Jerome W. McAllister, Hudson, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 3, 1985, Ser. No. 740,577
Int. Cl.[4] B32B 3/00
U.S. Cl. 428—209 21 Claims

1. Glass microbubbles having an average density not exceeding 1.0 g/cm^3 and an average diameter from 5 to 200 micrometers wherein the improvement comprises:

the microbubbles have an inorganic thin-film coating having an average thickness not exceeding 10 nm.

4,618,526

CURABLE COMPOSITIONS CONTAINING MULTIGLYCIDYL ETHERS AND A SULFONIC ACID AMIDE

Jody R. Berman, Lake Jackson; Dennis L. Steele, Freeport, and Michael P. Kubisiak, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

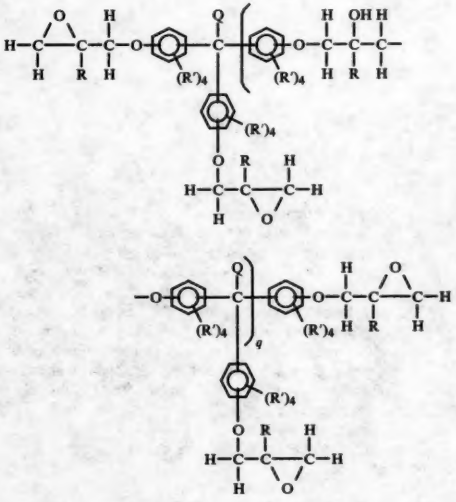
Filed Jul. 22, 1985, Ser. No. 757,692
Int. Cl.[4] C08G 59/32, 59/40
U.S. Cl. 428—209 25 Claims

1. A curable composition comprising a mixture of

(A) at least one of

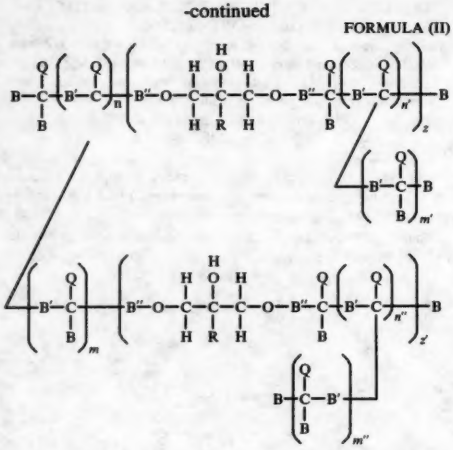
(I) at least one epoxy resin represented by the following formulas (I) or (II)

FORMULA (I)

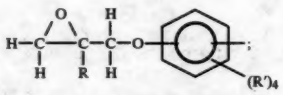


-continued

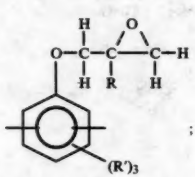
FORMULA (II)



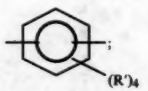
wherein each B is represented by the formula



each B' is represented by the formula



each B'' is represented by the formula



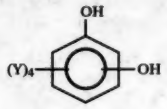
each R is independently hydrogen or an alkyl group having from 1 to about 4 carbon atoms; each Q is independently hydrogen or a hydrocarbyl group having from 1 to about 10 carbon atoms; each R' is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms or a halogen; m has a value of n − 1; m' has a value of n' − 1; m'' has a value of n'' − 1; each n, n' and n'' independently has a value from zero to about 3; q has a value from zero to about 4; and each z and z' independently has a value from zero to about 3;

(2) the reaction product of

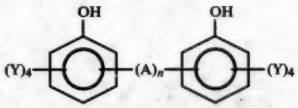
(a) at least one epoxy resin as defined in component (A-1) and

(b) at least one dihydric phenol represented by the following formulas (III) or (IV)

FORMULA (III)



FORMULA (IV)



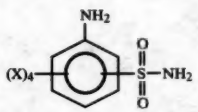
wherein A is a divalent hydrocarbon group having from 1 to about 12 carbon atoms, —S—, —S—S—,

or —O—; each Y is independently hydrogen, a halogen or a hydrocarbyl or hydrocarbyloxy group having from 1 to about 10 carbon atoms; and n has a value of zero or 1; and wherein components (a) and (b) are present in quantities such that the ratio of phenolic hydroxyl groups to epoxide groups is from about 0.01:1 to about 0.5:1;

(3) mixtures thereof;

(B) at least one amine substituted aromatic sulfonic acid amide represented by the following formula (V)

FORMULA (V)



wherein each X is independently hydrogen, a monovalent hydrocarbyl group having from 1 to about 10 carbon atoms or a halogen; and wherein components (A) and (B) are present in quantities such that the ratio of epoxy groups to hydrogen atoms attached to a nitrogen atom is from about 0.8:1 to about 2:1.

4,618,527

GOOD MACHINEABILITY FILM STRUCTURE

Rene H. Doyen, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 6, 1985, Ser. No. 805,633

Int. Cl.[4] B32B *7/02, 7/12, 27/00*

U.S. Cl. 428—213 **16 Claims**

1. A biaxially oriented film structure comprising:

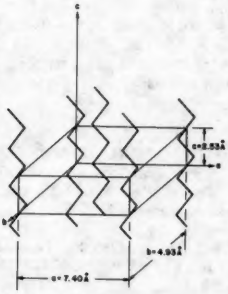
(I) a comparatively thick base layer of a thermoplastic resin containing: an anti-static combination of (a) a compound of the formula $RN(R_1)_2$, wherein R is a C_6–C_{24} alkyl group; R_1 is H $(OCH_2CH_2)_n$; n = 1–25; and (b) a monoester of an aliphatic C_2–C_8 polyhydric alcohol and a C_{12}–C_{24} fatty acid; and a slip improving proportion of (c) a C_{12}–C_{24} fatty amide; and

(II) a comparatively thin surface layer on at least one surface of (I), said surface layer comprising a thermoplastic resin containing an anti-block and COF reducing proportion of a finely divided inorganic material.

4,618,528
POLYMER FILMS CONTAINING PLATELET PARTICLES

William Sacks, Gillette; John P. Sibilia, Livingston; Abraham M. Kotliar, Westfield, all of N.J.; Harold D. Oltmann, and Shu P. Chen, both of Baton Rouge, La., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 405,225, Aug. 5, 1982, Pat. No. 4,528,235.
This application Apr. 15, 1985, Ser. No. 709,264
Int. Cl.[4] B32B *7/02, 5/16, 27/34*
U.S. Cl. 428—216 11 Claims



1. A film having at least one layer comprising:

a polyamide having a melt index of from 0.01 to 10 g/10 minutes as measured on ASTM D-1238 at 1000 gram load at 235° C., and from 10 to 50 weight percent of a platelet filler wherein the filler has an average equivalent diameter of from 1 to 8 micrometers, a maximum diameter of 25 micrometers, and a thickness of less than 0.5 micrometers, the filler being homogeneously distributed through the film and substantially parallel to the plane of the film, the film being from 10 to 100 micrometers in thickness.

4,618,529
INORGANIC FIBER-REINFORCED CERAMIC COMPOSITE MATERIAL

Takemi Yamamura; Masshiro Tokuse, and Yoshiharu Waku, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Apr. 19, 1985, Ser. No. 725,128
Claims priority, application Japan, Apr. 24, 1984, 59-81156
Int. Cl.[4] D03D *3/00*
U.S. Cl. 428—224 8 Claims

1. An inorganic fiber-reinforced ceramic composite material comprising a matrix of a ceramic and inorganic fibers as a reinforcing material, characterized in that

(a) the inorganic fibers are inorganic fibers containing silicon, either titanium or zirconium, carbon and oxygen and being composed of

(i) an amorphous material consisting substantially of Si, M, C and O, or

(ii) an aggregate consisting substantially of ultrafine crystalline particles with a particle diameter of not more than 500 Å of β-SiC, MC, a solid solution of β-SiC and MC and MC_{1-x}, and amorphous SiO_2 and MO_2, provided that in the above formulae, M represents titanium or zirconium, and x is a number represented by $0<x<1$, or

(iii) a mixture of the amorphous material (i) and the aggregate (ii),

(b) the ceramic is at least one material selected from the group consisting of carbides, nitrides, oxides, glass ceramics, graphite and inorganic materials containing silicon, either titanium or zirconium, carbon and oxygen and composed of

(i) an amorphous material consisting substantially of Si, M, C and O, or

(ii) an aggregate consisting substantially of ultrafine crystalline particles with a particle diameter of not more than 500 Å of β-SiC, MC, a solid solution of β-SiC and MC and MC_{1-x}, and amorphous SiO_2 and MO_2, provided that in the above formulae, M represents titanium or zirconium, and x is a number represented by $0<x<1$, or

(iii) a mixture of the amorphous material (i) and the aggregate (ii),

(c) the inorganic fibers have an initial reaction degradation speed of not more than 0.35 $kg/mm^2.sec^{-1}$ and a tenacity reduction ratio of not more than 40% during the production of the composite material,

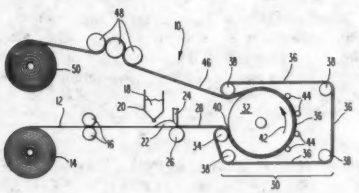
(d) the composite material has a critical stress intensity factor about 2 to 7 times as high as that of said matrix alone, and

(e) the composite material has a bending strength reduction ratio, measured by a thermal shock fracture resistance measuring method, of not more than about 10% after it is heat-treated in air at 800° to 1300° C. immediately then dipped in water at room temperature, and then dried.

4,618,530
PROCESS FOR THE PREPARATION OF A COMPOSITE MAT

John R. Stetson, Lebanon, N.J., assignor to Congoleum Corporation, Kearny, N.J.

Continuation of Ser. No. 549,949, Nov. 9, 1983, abandoned. This application Feb. 12, 1986, Ser. No. 831,045
Int. Cl.[4] B32B *5/02;* B05D *3/02*
U.S. Cl. 428—236 9 Claims



1. A process for the preparation of a foamable composite mat having a smooth and printable first surface and a smooth and adherable opposite surface which foamable composite mat may be foamed to a uniform expanded thickness and which composite mat comprises a fibrous mat encapsulated within a foamable, printable resinous polymeric gel which process comprises:

(a) providing a supply of suitable fibrous mat material;

(b) combining a controlled amount of a foamable, liquid resinous polymeric composition with said fibrous mat material in such a manner that the foamable liquid permeates into and through the interstices of the fibrous material and coats both surfaces of said fibrous mat, wherein the foamable liquid resinous polymeric composition is capable of forming a printable resinous polymeric gel at a suitable temperature, thereby providing a foamable liquid resinous polymeric composition saturated fibrous mat having a uniform thickness;

(c) providing a suitable environment for the gellation of said foamable liquid resinous polymeric composition, said suitable environment for the gellation of said foamable liquid resinous polymeric composition consisting of a heated, rotary drum at least partially enclosed with a seamless belt, wherein the surface of said seamless belt coming into contact with the foamable liquid resinous polymeric composition has been coated with a silicone rubber; and

(d) maintaining the foamable liquid saturated fibrous mat

within said suitable environment for a sufficient period of time to gel the foamable liquid resinous polymeric composition to produce a fibrous mat encapsulated within a foamable and printable resinous polymeric gel.

4,618,531

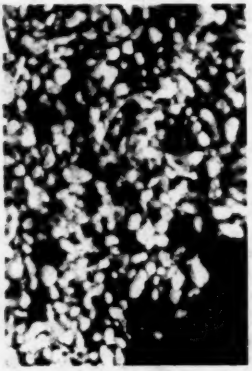
POLYESTER FIBERFILL AND PROCESS

Ilan Marcus, Versoix, Switzerland, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 15, 1985, Ser. No. 734,423

Int. Cl.[4] B32B *5/16*

U.S. Cl. 428—283 **18 Claims**



1. Refluffable fiberballs of average dimension 1 15 mm, consisting essentially of randomly-arranged, entangled, spirally-crimped polyester fiberfill having a cut length of about 10 to about 60 mm, and having a cohesion measurement as defined of less than 6 Newtons (N).

4,618,532

UPHOLSTERED SEAT HAVING AN AIR-PERMEABLE COVERING AND A COLD FOAM CORE

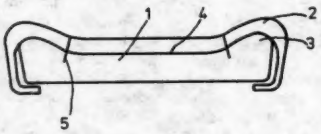
Robert Volland, Leverkusen; Hans-Albrecht Freitag, Bergisch Gladbach; Johannes Seesing, Leverkusen, and Herbert Bergmann, Kuerten-Broich, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 15, 1984, Ser. No. 641,118

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1983, 3330760

Int. Cl.[4] B32B *3/26*

U.S. Cl. 428—304.4 **4 Claims**



1. An upholstered seat comprising:

(a) an in situ foam core based on a cold foam formulation,

(b) a foam-impermeable sealing layer which covers said foam core and which is selected from the group consisting of paper, paper-like products, and films which are capable of being dissolved, and

(c) an air-permeable covering which covers said sealing layer.

4,618,533

POROUS MEMBRANE HAVING HYDROPHILIC SURFACE AND PROCESS

Michael J. Steuck, N. Reading, Mass., assignor to Millipore Corporation, Bedford, Mass.

Filed Nov. 30, 1984, Ser. No. 676,681

Int. Cl.[4] B32B *3/26*

U.S. Cl. 428—315.7 **38 Claims**

1. A composite porous thermoplastic membrane which comprises a porous membrane substrate having an average pore size between about 0.001 and 10 microns formed of a first polymer, said substrate being directly coated on its entire surface with a cross-linked second polymer formed from a monomer polymerized in situ with a free radical initiator and cross-linked in situ on said substrate, said composite porous membrane having essentially the same porous configuration as said porous membrane substrate.

4,618,534

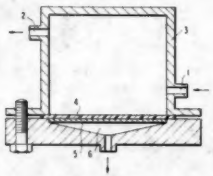
COMPOSITE MEMBRANE AND PROCESS FOR PRODUCING THE SAME

Akio Iwama; Kentaro Tasaka, and Yoshitaka Kazuse, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 23, 1984, Ser. No. 663,750

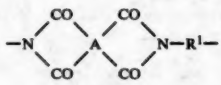
Int. Cl.[4] B32B *3/26*; C08D *5/20*

U.S. Cl. 428—316.6 **21 Claims**



1. A composite membrane comprising

an anisotropic membrane made of a polyimide resin comprising a dense surface layer and a porous layer continuously connected to the dense surface layer, said polyimide resin consisting essentially of a repeating unit represented by the formula:



wherein A is a tetravalent aliphatic or aromatic group, and R^1 is a divalent aromatic, alicyclic or aliphatic hydrocarbon group, or a divalent organic group comprising the hydrocarbon groups linked with a divalent organic linking group, and

a cross-linked silicone resin thin film formed on the dense surface layer of the anisotropic membrane.

4,618,535

MAGNETIC RECORDING MEDIUM

Masaharu Nishimatsu, Komoro; Toshiaki Ide; Hiroyuki Arioka, both of Saku, and Yuichi Kubota, Komoro, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 642,208

Claims priority, application Japan, Sep. 12, 1983, 58-166677

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—325 **6 Claims**

1. A magnetic recording medium comprising a plastic base film, a thin magnetic metal layer formed on one side of the base film and a backing layer formed on the other side of the base

film, characterized in that the backing layer is composed essentially of a thermoset or radiation-cured resin and carbon black and inorganic compound powder uniformly dispersed in the resin, and has a surface roughness of from 0.05 to 0.4 μm, said carbon black having an average particle size of from 10 to 150 mμm as measured by an electron microscope, said inorganic compound powder having a Mohs hardness of at most 6 and a particle size of from 10 to 500 mμm, and the weight ratio of the carbon black to the inorganic compound powder being from 1:9 to 9:1.

4,618,536

MAGNETIC RECORDING MEDIUM

Akira Morioka; Takeshi Matsuura, both of Kyoto, and Yoshiyuki Takahira, Suita, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Sep. 4, 1984, Ser. No. 647,244
Claims priority, application Japan, Sep. 7, 1983, 58-165779
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—329 1 Claim

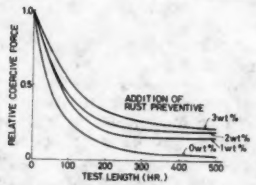
1. An abrasion resistant magnetic recording medium comprising a base material and a magnetic layer provided thereon, said magnetic layer containing magnetic particles, a binder, and a mixture of abrasion resistant particles consisting essentially of alpha-Fe_2O_3 particles having an average particle size of from 0.4 to 2.0 microns in an amount of from 2 to 10% by weight to the weight of the magnetic particles, Al_2O_3 particles having an average particle size of from 0.2 to 0.7 micron in an amount of from 2 to 4% by weight to the weight of the magnetic particles and Cr_2O_3 particles having an average particle size of from 0.4 to 1.5 microns in an amount of from 0.2 to 1.0% by weight to the weight of the magnetic particles.

4,618,537

RECORDING MEDIUM

Katsuhiko Takano, Yokohama; Shigeharu Iijima; Satoshi Yoshihara, both of Kawasaki; Masaaki Matsushima, Machida; Hiroyoshi Kishi, Tokyo, and Eizo Sasamori, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1984, Ser. No. 573,478
Claims priority, application Japan, Jan. 31, 1983, 58-12940
Int. Cl.[4] G11B 5/72
U.S. Cl. 428—336 21 Claims



1. A recording medium which comprises a substrate, a recording layer formed on the substrate, an anticorrosive adhesive layer formed on the recording layer and containing a chemical agent capable of preventing corrosion of the recording layer and inert to the recording layer, and a protective plate bonded to the recording layer through the anticorrosive layer.

17. A recording medium which comprises two substrates, a recording layer formed on each of the substrates, and an anticorrosive adhesive layer containing a chemical agent capable of preventing corrosion of the recording layer and inert to the recording layer, said anticorrosive layer bonding said two substrates such that the recording layers face each other.

4,618,538

COLORED ENAMEL COMPOSITION FOR OBTAINING DECORATIVE LAYERS OF FLOAT GLASS SHEETS

Heinfried Emonts, Aachen, and Franz Gebhardt, Wurselen, both of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Aubervilliers, France

Filed Sep. 12, 1985, Ser. No. 775,286
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1984, 3433408
Int. Cl.[4] B32B 17/06; B05D 5/00
U.S. Cl. 428—428 14 Claims

1. An enamel composition having a baking temperature corresponding substantially to the softening temperature of a float glass glazing for forming an enamel coating layer thereon, consisting essentially of

(a) a vitreous matrix amounting to at least 75% by weight of the enamel composition having the following features

(1) a composition, by weight, including

SiO_2: 25–33
PbO: 47–65
B_2O_3: 3–7
Na_2O: 1–4
K_2O: 0–2
Li_2O: 0–0.8
ZnO: 0.2–5

wherein the molar ratio of SiO_2 to PbO is between 1.6 and 2.7 and the total of alkaline oxides present being less than 5% by weight, and

(2) a linear thermal expansion coefficient in the range of temperature of 20° to 300° C. less than that of the glazing to be coated;

(b) pigments; and

(c) tin dioxide in an amount up to about 5% by weight of the enamel composition.

4,618,539

CORROSION-INHIBITING COMPOSITIONS, AND OIL COMPOSITIONS CONTAINING SAID CORROSION-INHIBITING COMPOSITIONS

Richard W. Jahnke, Mentor, and William C. Woerner, Pepper Pike, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Dec. 6, 1984, Ser. No. 678,731
Int. Cl.[4] B32B 15/04; C04B 9/02
U.S. Cl. 428—470 29 Claims

1. A corrosion-inhibiting composition comprising a mixture of

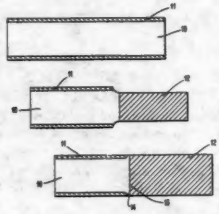
(A) at least one oil-soluble neutral or basic alkali metal or alkaline earth metal salt or complex of at least one organic acid, and

(B) at least one nitrogen- and boron-containing composition which is the reaction product of at least one amino alcohol, at least one of a boric acid or boron trioxide, and at least one organic carboxylic acid; with the proviso that said corrosion-inhibiting composition is free of microcrystalline wax.

4,618,540
COMPOUND BODY AND METHOD OF MAKING THE SAME

Johan P. von Holst, Sandviken, and Rolf G. Oskarsson, Rönninge, both of Sweden, assignors to Santrade Limited, Lucerne, Switzerland

Filed May 2, 1984, Ser. No. 606,296
Claims priority, application Sweden, May 13, 1983, 8302735
Int. Cl.[4] B22F 7/02, 7/04
U.S. Cl. 428—552 16 Claims



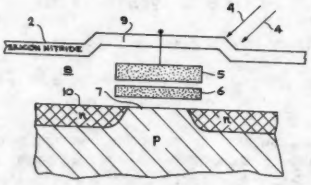
1. A compound body of at least two parts, one of said at least two parts being a wear-resistant surface consisting essentially of a hard material of from 30 to 70 volume percent of particles selected from the group consisting of carbides, nitrides, carbonitrides and mixtures thereof of metals selected from the group consisting of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W and mixtures thereof, in a matrix based on a metal selected from the group consisting of Fe, Ni, Co and mixtures thereof, and another of said at least two parts being a supporting surface consisting essentially of high speed steel or tool steel, the thickness of the wear-resistant surface being from 3 to 50% of the radial dimension of the said compound body.

13. Method of making a compound body according to claim 1, characterized in that a body of high speed steel or tool steel is placed in a powder mixture consisting of 30–70 by volume of hard constituents formed by particles selected from the group consisting of carbides, nitrides and carbonitrides and mixtures thereof of a metal selected from the group consisting of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W and mixtures thereof in a matrix based on a metal selected from the group consisting of Fe, Ni, Co, and mixtures thereof after which the body and the powder mixture are compacted by cold isostatic pressing to form an extrusion billet, which then is placed in a can and hot extruded to a compound body blank.

4,618,541
METHOD OF FORMING A SILICON NITRIDE FILM TRANSPARENT TO ULTRAVIOLET RADIATION AND RESULTING ARTICLE

Abdul R. Forouhi, San Jose, and Bert L. Allen, Los Altos, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 21, 1984, Ser. No. 684,516
Int. Cl.[4] B44C 5/08
U.S. Cl. 428—688 22 Claims

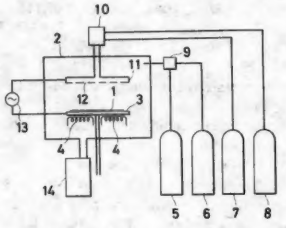


1. A method for forming an ultraviolet radiation transparent silicon nitride film on a substrate, comprising:
heating a reaction chamber;
placing said substrate into said reaction chamber;
evacuating said reaction chamber;
establishing a flow of silane and ammonia, such that an essentially small ratio of silane-to-ammonia atmosphere is established in said chamber;
passing said flow over said substrate; and
catalyzing said atmosphere, such that said silane and said ammonia react to deposit an ultraviolet radiation transparent silicon nitride film on said substrate.

4,618,542
MAGNETIC THIN FILM

Haruyuki Morita; Jiro Yoshinari, and Masatoshi Nakayama, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Nov. 21, 1984, Ser. No. 673,987
Claims priority, application Japan, Nov. 21, 1983, 58-217801; Nov. 29, 1983, 58-223070
Int. Cl.[4] G11B 5/64
U.S. Cl. 428—694 15 Claims



1. A magnetic crystalline thin film comprised of at least one magnetic metal and vapor phase grown on a substrate, said thin film being prepared by a process comprising the steps of
introducing a chemical compound of the metal in vapor form and a reducing gas into an evacuated vacuum chamber where the substrate is placed,
subjecting the reaction gases to plasma excitation, thereby achieving the vapor phase growth of the magnetic thin film on the substrate while the substrate is held at a temperature of lower than 100° C., and
heat treating the metal thin film at a temperature of at least 200° C. in a non-oxidizing atmosphere or at a temperature of at least 100° C. in a non-oxidizing plasma.

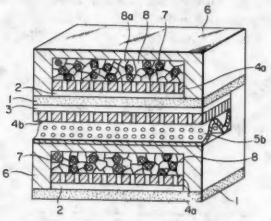
4,618,543
FUSED CARBONATE-TYPE FUEL CELL

Mitsuie Matsumura, Ashiya; Motomu Yoshimura, Kishiwada, and Hiroaki Urushibata, Kawanishi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1985, Ser. No. 755,013
Claims priority, application Japan, Jul. 13, 1984, 59-146323
Int. Cl.[4] H01M 8/14
U.S. Cl. 429—19 9 Claims

1. A fused carbonate-type fuel cell comprising
a fused carbonate electrolyte matrix,
a first and second electrodes in contact with the opposite surfaces of the electrolyte matrix, the first electrode being positioned on a fuel gas side and the second electrode being positioned on an oxidizing gas side,
a partition plate for supporting the first electrode on the fuel gas side and a supporting plate for supporting the second electrode on the oxidizing gas side,
an oxidizing gas passageway adjacent to the supporting plate for supporting the second electrode, and
a fuel gas passageway adjacent the supporting plate for

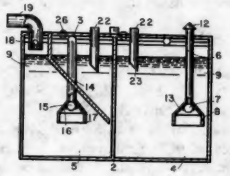
supporting the first electrode, which passageway contains a reforming catalyst which comprises catalyst particles supported on a carrier held in a metallic porous body disposed in the fuel gas passageway.



4,618,544
EXPLOSION PROOF BATTERY

Alan C. Brooks, 572 Darlington La., Apt. 24, Crystal Lake, Ill. 60014

Filed Aug. 5, 1985, Ser. No. 762,428
Int. Cl.[4] H01M *2/12*
U.S. Cl. 429—53 **4 Claims**



1. A portable explosion proof battery comprising; in combination,

(a) more than one cell, each cell having a top, a bottom and sides wherein,

(b) the top is provided with a cover which has operably joined therewith a gas entry check valve which admits atmospheric air to the cell, a gas exit check valve, a continuously self sealing liquid input and removal passage, and a liquid level indicator sight rod, and

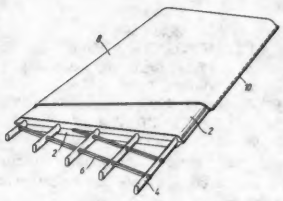
(c) the gas entry check valve and the gas exit check valve are associated with fluid carrying paths, between the cell and a liquid filled combustion barrier chamber.

4,618,545
RECOMBINATION ELECTRIC STORAGE CELLS

Gordon A. Clegg, Rossendale, and Phillip Jarrett, Bramhall, both of England, assignors to Chloride Group Public Limited Company, London, England

Filed Jun. 21, 1985, Ser. No. 747,438
Claims priority, application United Kingdom, Jun. 22, 1984, 8415949
Int. Cl.[4] H01M *2/18*
U.S. Cl. 429—130 **11 Claims**

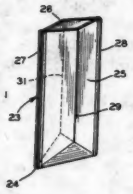
1. A recombination electric storage cell comprising a container, a plurality of alternating positive and negative plates within said container and a plurality of separators, each adjacent pair of said plates being separated by one of said separators, said plates and separators being under a mutual compressive force, each said separator comprising reinforcing means and microfine glass fibre material surrounding said reinforcing means, said reinforcing means comprising one or more reinforcing members and extending over substantially the entire area of said separator and having a plurality of apertures in the reinforcing means, said apertures being substantially filled with said microfine glass fibre material, the reinforcing members being so constructed and arranged that the major proportion of said compressive force is transmitted through said reinforcing members while substantially the entire proportion of the surface area of said plates is contacted by said glass fibre material.



4,618,546
CELL SEPARATOR BASKET AND METHOD OF FORMING SAME

Robert D. Simonton, Fremont; John D. Cattano, Castalia, and Robert K. Mason, Gibsonburg, all of Ohio, assignors to Fremont Special Machine Co., Inc., Fremont, Ohio

Filed Mar. 4, 1985, Ser. No. 707,887
Int. Cl.[4] H01M *2/18*; B32B *3/20*
U.S. Cl. 429—133 **13 Claims**



1. A primary cell separator basket preform comprising a rectangular sheet of ionically permeable material folded upon itself across the width of the rectangle to form first and second rectangular superimposed walls joined at said fold, a face-to-face bond between said first and second walls along each of two straight margin portions of said rectangular first and second walls to cooperate with said fold to join said walls along three contiguous straight margin portions as a continuous junction, the fourth straight margin portions of the overlying first and second walls being free from each other, and an outwardly crowned crease in said wall extending from the fourth straight margin portion of said first wall which is free from said second wall.

4,618,547
LEAK RESISTANT NON-TACKY SEALANT

Charles Markin, Toronto, Canada, assignor to Duracell Inc., Bethel, Conn.

Filed Oct. 6, 1983, Ser. No. 539,453
Int. Cl.[4] H01M *2/08*
U.S. Cl. 429—174 **9 Claims**

1. An electrochemical cell sealed with an insulative sealing member having a sealant material thereto characterized in that said sealant material is substantially non-tacky and is comprised of a solvent castable, film forming thermoplastic polymer selected from the group consisting of acrylic, nylon, polypropylene, polyethylene and polyvinylchloride; and a polymeric binder material, which is in the liquid state at room temperature, selected from the group consisting of polybutene, polyisobutene, polybutadiene resins, carboxyl terminated polybutadiene, and hydroxyl terminated butadiene, and wherein

said liquid binder material comprises between 5-45% by weight of said sealant material.

4,618,548

ELECTROLYTE ADDITIVE

James E. Brule, South Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 18, 1985, Ser. No. 712,978
Int. Cl.[4] H01M *6/14*
U.S. Cl. 429—194 7 Claims

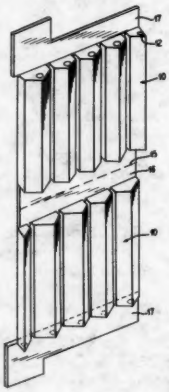
1. In a battery comprising an anode having lithium metal as the anode-active material, a cathode having a metal chalcogenide as the cathode-active material, and a nonaqueous electrolyte containing an ionizable lithium salt as the solute and a dipolar aprotic organic solvent therefor, the improvement which comprises said nonaqueous electrolyte further contains 1,4-diazabicyclo [2.2.2] octane as an energy density enhancing additive in an amount from about 2% by weight to about 8% by weight.

4,618,549

SANDWICH ELECTRODE AND A BATTERY COMPRISING THE SAME

Ove K. G. Nilsson, Utterstigen 1, S-440 41 Nol, Sweden

PCT No. PCT/SE84/00007, § 371 Date Sep. 12, 1984, § 102(e) Date Sep. 12, 1984, PCT Pub. No. WO84/02806, PCT Pub. Date Jul. 19, 1984
PCT Filed Jan. 13, 1984, Ser. No. 653,241
Claims priority, application Sweden, Jan. 13, 1983, 8300141; May 19, 1983, 8302808
Int. Cl.[4] H01M *4/70, 4/76*
U.S. Cl. 429—234 5 Claims



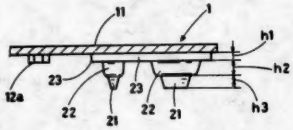
1. An electrode for a lead-acid battery, comprising: a frame of an acid resistant plastic material holding a current grid and active material covered by a porous pervious web, said electrode comprising at least two portions, each portion constituting a frame portion of plastic material having a grid and surrounding active material disposed in shallow troughs and covered by a web on one side thereof, and interengageable with a similar frame portion, back to back, so as to jointly form the electrode, each said frame portion having a plurality of parallel, elongated recesses, each holding active material, and a grid spine of an electrically conductive material extending into the active material from an upper grid frame.

4,618,550

RESIN PRINTING PLATE AND PREPARATION THEREOF

Seiichi Uchida, Moriguchi, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 690,550, Jan. 11, 1985. This application Jan. 24, 1986, Ser. No. 822,194
Claims priority, application Japan, Jul. 23, 1984, 59-154611; Nov. 6, 1984, 59-168182[U]
Int. Cl.[4] G03F *7/02*
U.S. Cl. 430—11 3 Claims



1. A printing plate comprising a base portion formed from a photosensitive curable resin on a transparent base film, a mount portion formed on the base portion and having a contour corresponding to and larger than a printing pattern, and a relief portion formed on the mount portion and corresponding to the printing pattern, the printing plate being characterized in that the base portion is formed around the mount portion, the base film being exposed outside the base portion.

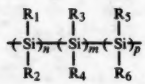
4,618,551

PHOTORESPONSIVE IMAGING MEMBERS WITH POLYSILYLENES HOLE TRANSPORTING COMPOSITIONS

Milan Stolka; Damodar M. Pai, both of Fairport; Thomas W. Smith, Penfield, all of N.Y.; James M. Duff, Mississauga, and Rafik O. Loutfy, Willowdale, both of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 25, 1985, Ser. No. 694,862
Int. Cl.[4] G03G *5/10*
U.S. Cl. 430—58 21 Claims

1. An improved layered photoresponsive imaging member comprised of a supporting substrate, a photogenerating layer, comprised of inorganic or organic photoconductive pigments, and as a hole transport layer in contact therewith a polysilylene compound of the formula



wherein R_1, R_2, R_3, R_4, R_5 and R_6 are independently selected from the group consisting of alkyl, aryl, substituted alkyl, substituted aryl, and alkoxy; and n, m, and p are numbers that represent the percentage of the monomer unit in the polysilylene.

4,618,552

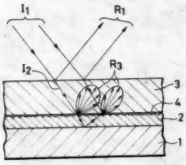
LIGHT RECEIVING MEMBER FOR ELECTROPHOTOGRAPHY HAVING ROUGHENED INTERMEDIATE LAYER

Shigemori Tanaka; Fumio Sumino, both of Tokyo, and Hitoshi Toma, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1985, Ser. No. 700,973
Claims priority, application Japan, Feb. 17, 1984, 59-28273; Mar. 7, 1984, 59-42171
Int. Cl.[4] G03G *5/14*
U.S. Cl. 430—60 27 Claims

1. A light receiving member comprising an intermediate layer between a substrate of a metal or an alloy having a reflec-

tive surface and a photosensitive layer, the reflective surface of said substrate forming a light-diffusing reflective surface, and



the surface of said intermediate layer forming a rough surface having an average surface roughness of about 0.5 to 30 μm.

4,618,553

ELECTROPHOTOGRAPHIC RECORDING MATERIAL COMPRISES BACKING LAYER CONTAINING LONG-CHAIN ALKANOIC ACID METAL SALT

Yasuaki Yuyama; Junji Nakano; Shyunichi Kondo; Hideo Sato, and Kenichi Sawada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 28, 1985, Ser. No. 737,967

Claims priority, application Japan, May 28, 1984, 59-108010

Int. Cl.⁴ G03G *5/10*

U.S. Cl. 430—69 **11 Claims**

1. An electrophotographic recording material comprising a support having provided thereon a photoconductive layer and a backing layer provided on the opposite side of the support, wherein said backing layer comprises a binder and a long-chain alkanoic acid metal salt represented by the formula:

$$(RCOO)_nM$$

wherein M represents a mono-, di- or trivalent metal; R represents an alkyl group having from 12 to 21 carbon atoms and n represents 1, 2 or 3.

4,618,554

ELECTROPHOTOGRAPHIC PHOTORECEPTOR HAVING PHOTOSENSITIVE LAYER MADE OF A PHTHALOCYANINE TREATED WITH AN ACRYLIC RESIN

Masato Ohashi; Motohiko Kashioka, both of Toda; Shinichi Tamura, Tokyo; Hiromitsu Katsura, Tokorozawa; Hideaki Ueda, Kawanishi, and Akihiro Nakamura, Toyonaka, all of Japan, assignors to Toyo Ink Mfg. Co., Ltd., Tokyo and Minolta Camera Kabushiki Kaisha, Osaka, both of, Japan

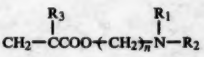
Filed Mar. 26, 1985, Ser. No. 715,985

Claims priority, application Japan, Mar. 30, 1984, 59-60866

Int. Cl.⁴ G03G *5/06*

U.S. Cl. 430—78 **6 Claims**

1. An electrophotographic photoreceptor having a photosensitive layer comprising a binding resin and phthalocyanine dispersed therein, wherein the phthalocyanine has been treated with an acrylic resin in an amount of 0.5 to 50 parts by weight of acrylic resin based on 100 parts by weight of phthalocyanine; said acrylic resin having been obtained by polymerization of not less than 15 mole % of a monomer represented by the general formula (I),



(I)

wherein R_1 and R_2 independently represent a hydrogen atom or an alkyl, aryl or cycloalkyl group, or R_1 and R_2, taken together, may form a heterocyclic-ring containing a nitrogen atom, R_3 represents a hydrogen atom or methyl group, and n represents an integer of 1 or more, or an acid salt of the monomer.

4,618,555

ELECTROPHOTOGRAPHIC PHOTORECEPTOR COMPRISING AZO COMPOUNDS

Tetsumi Suzuki, Isehara; Tetsuo Murayama, Machida; Hitoshi Ono, Yokohama; Shinji Aramaki, Machida, and Michiyo Yokoyama, Yokohama, all of Japan, assignors to Mitsubishi Chemical Ind., Ltd., Tokyo, Japan

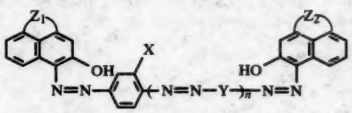
Filed Dec. 27, 1984, Ser. No. 686,991

Claims priority, application Japan, Jan. 11, 1984, 59-3167

Int. Cl.⁴ G03G *5/06, 5/14*

U.S. Cl. 430—78 **13 Claims**

1. An electrophotographic photoreceptor having a photosensitive layer in which a photoconductive substance of azo compound having the general formula (I):



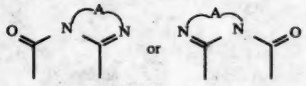
(I)

wherein

X is selected from the group consisting of hydrogen atom, lower alkyl group, lower alkoxy group, halogen atom and cyano group;

Y is phenylene or naphthylene group;

Z_1 and Z_2 are independently the divalent group represented by the following formula:



wherein

A is a divalent group derived from the aromatic hydrocarbon or heterocyclic compound including one or more nitrogen atoms in the ring; and

n is 1 or 2, is incorporated.

4,618,556

DEVELOPER AND DEVELOPING METHOD

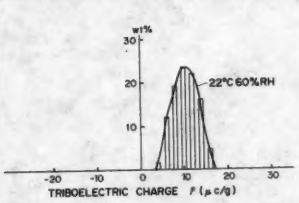
Masanori Takenouchi, Urawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 522,501, Aug. 12, 1983, abandoned. This application Jul. 3, 1985, Ser. No. 751,994

Claims priority, application Japan, Aug. 23, 1982, 57-145823; Sep. 3, 1982, 57-154127; Sep. 8, 1982, 57-157156; Sep. 8, 1982, 57-157157; Dec. 29, 1982, 57-231526; Dec. 29, 1982, 57-231527; Mar. 8, 1983, 58-37705; Mar. 8, 1983, 58-37706; Mar. 9, 1983, 58-39807; Apr. 7, 1983, 58-61884

Int. Cl.⁴ G03G *9/08*

U.S. Cl. 430—110 **18 Claims**



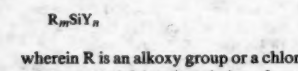
1. A developer comprising a binder resin, a colorant and a

positive charge controller, said positive charge controller comprising fumed silica particles treated with a coupling agent having a hydrolyzable group and a non-hydrolyzable organic group bonded to a tetravalent center atom of Si or Ti, said positive charge controller having a hydrophobicity within the range of from 30 to 80 as measured by the methanol titration test, in which said coupling agent is a silane or titanate coupling agent selected from the group consistng of formula compounds (1), (2) or (3), wherein formula (1) compounds have the formula:

$$R_mSiY_n \quad (1)$$

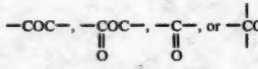
wherein R is an alkoxy group or a chlorine atom; m and n are integers satisfying the relation of m+n=4; Y is an organic group containing at least one of amino, vinyl, glycidoxy, mercapto, methacryl, and ureido groups;

wherein formula 2 compounds are cation type unsaturated amino-functional silanes selected from the compounds represented by formula 2 as follows:



(2)

wherein X is a hydroxyl group or a hydrolyzable group; R is an alkyl having 1 to 6 carbon atoms; n is an integer of 1 to 3; Q is a divalent hydrocarbon group or an organic group containing oxygen in the form of

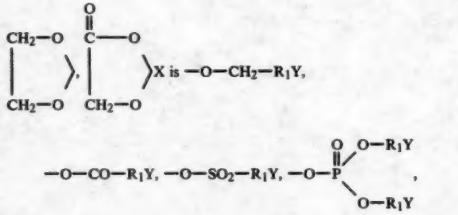


or nitrogen in the form of R^2N= group; R^1 is a hydrogen atom, an alkyl group having 1 to 6 carbon atoms or a heterocyclic organic group having a nitrogen in the ring; m is 2; Z is a divalent organic group having a conjugated double bond with

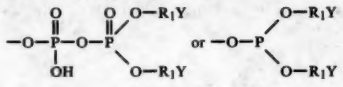
and bonded through C—N bonding to the nitrogen atom; R^2 is hydrogen atom or an alkyl having 1 to 6 carbon atoms; and Y is an acid anion or a hydrolyzed product of said cation type unsaturated amino-functional silane; and wherein formula 3 compounds are titanium compounds represented by the formula (3) as follows:

$$R_m—Ti—X_n \quad (3)$$

wherein m and n are 1 and 2, respectively, or 4 and 2, respectively; R is an alkoxy group,



-continued



wherein in the above formulae, R_1 is a saturated or unsaturated divalent aliphatic group having 1 to 31 carbon atoms or a divalent aromatic hydrocarbylene group; Y is a hydrogen atom or an amino group; and a plurality of X, R_1 and Y existing in the same compound being the same or different, respectively.

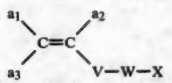
4,618,557

LIQUID DEVELOPER FOR ELECTROSTATIC PHOTOGRAPHY

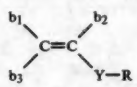
Shigeyuki Dan; Kazuo Ishii; Eiichi Kato, and Hidefumi Sera, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 7, 1985, Ser. No. 763,112
Claims priority, application Japan, Aug. 7, 1984, 59-165088
Int. Cl.[4] G03G 9/12
U.S. Cl. 430—114 **10 Claims**

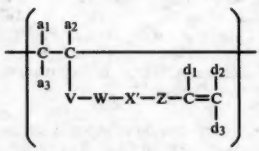
1. A liquid developer for electrostatic photography comprising a carrier liquid having an electric resistance of at least 10^9 Ω-cm and a dielectric constant of not more than 3.5, and a resin dispersed therein, said resin being obtained by polymerizing a monomer, which is soluble in said carrier liquid but becomes insoluble upon being polymerized, in the presence of at least one kind of a soluble dispersion stabilizing resin, said soluble dispersion stabilizing resin being a copolymer containing at least recurring units represented by following formulae (IIIa) and (IIIb) obtained by applying a reaction for introducing an unsaturated bond into a copolymer obtained by polymerizing a monomer represented by formula (I) and a monomer represented by formula (II)



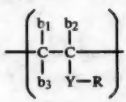
(I)



(II)



(IIIa)



(IIIb)

wherein

in formula (I), V represents —O—, —S—, —CO—, —CO_2—, —SO_2—, —OCO—, —CONH—, —CONR'— (wherein R' represents a hydrocarbon group), —NHCO—, —$NHCO_2$—, or —NHCONH—; X represents —CO_2H, —COCl, —OH, —SH, —NH_2, —NCO, or —$SO_2CH_2CH_2Cl$; W represents a hydrocarbon group linking said atomic group V and said atomic group X

directly or through a hetero atom or W represents a chemical bond; and a_1, a_2, and a_3 each represents a hydrogen atom, a hydrocarbon group, a carboxy group, or a carboxy group through a hydrocarbon group;

in formula (II), Y represents —O—, —S—, —CO—, —CO_2—, —SO_2—, —OCO—, CONH—, —CONR″— (wherein R″ represents a hydrocarbon group), —NHCO—, —$NHCO_2$—, or —NHCONH—; R represents a hydrocarbon group; and b_1, b_2, and b_3 each represents a hydrogen atom, a hydrocarbon group, a carboxy group, or a carboxy group through a hydrocarbon group;

in formula (IIIa), a_1, a_2, a_3, V, and W have the same meanings as defined for formula (I); X′ represents —CO_2—, —COS—, —SCO—, —CONH—, —OCO—, —NHCO—, —NHCONH—, —SO_2—, —O—, or —S—; Z represents a hydrocarbon group linking said atomic group X′ and unsaturated bond directly or through a hetero atom, or Z represents a chemical bond; the total number of atoms of the main chain portion of atomic group —V—W—X′—Z— must, however, be at least 9; and d_1, d_2, and d_3 each represents a hydrogen atom, a hydrocarbon group, a carboxy group, or a carboxy group through a hydrocarbon group; and

in formula (IIIb), b_1, b_2, b_3, Y, and R have the same meanings as defined for formula (II).

4,618,558

LIQUID DEVELOPER FOR USE IN ELECTROSTATIC PHOTOGRAPHY

Shinichi Kuramoto, and Hajime Takanashi, both of Numazu, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1984, Ser. No. 666,402

Claims priority, application Japan, Oct. 31, 1983, 58-204522

Int. Cl.[4] G03G *9/12*

U.S. Cl. 430—115 **7 Claims**

1. In a liquid developer for use in electrophotography which comprises a dispersion of toner particles and filler particles in a highly electrically insulating carrier liquid, said toner particles consisting essentially of colorant and resin and having wax contained therein, said filler particles being effective for preventing crushing of the developed image during transfer, the improvement which comprises: said filler particles consist essentially of 63.5 number % or more of filler particles having a particle diameter in the range of 10–20μ, 6.5 number % or less of filler particles having a particle size of over 20μ and 30 number % or less of filler particles having a particle size of not more than 10μ.

4,618,559

PROCESS OF MAKING ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Yuichi Yashiki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1985, Ser. No. 733,766

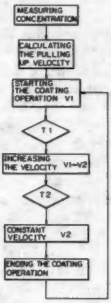
Claims priority, application Japan, May 17, 1984, 59-97480

Int. Cl.[4] G03G *5/087*

U.S. Cl. 430—127 **7 Claims**

1. In a process for preparing an electrophotographic photosensitive member by forming a charge generation layer on a substrate by dip-coating and forming a charge transport layer by dip-coating, wherein the charge transport layer forms a predetermined irregular end film portion of length H, which irregular film portion impairs the photosensitivity of the member, the improvement which comprises:

(a) controlling the thickness of the corresponding end film portion of the charge-generation layer over the length H by varying the withdrawal rate of the substrate during the dip-coating thereof in accordance with the formula



$$H = \int_0^{T1} V1\,dt + \int_{T1}^{T2} V(t)\,dt$$

wherein T1 is the total time which elapses from the start of the dip-coating of the charge generation layer until the portion of the charge generation film is reached which corresponds to one end of the length H; V1 is the withdrawal rate of the substrate which rate is maintained for the time T1; V(t) is the rate of acceleration of the substrate from the first rate, V1 to a final higher rate, V2; T2 is the elapsed time required to withdraw the substrate over the length H as the withdrawal rate increases from V1 to V2; and

(b) thereafter, completing the dip-coating of the charge generation layer at the rate, V2; whereby the total thickness of the charge generation layer and the charge transport layer over the length H is sufficient to improve the photosensitivity of the member.

4,618,560

MULTI-ACTIVE PHOTOCONDUCTIVE INSULATING ELEMENTS EXHIBITING VERY HIGH ELECTROPHOTOGRAPHIC SPEED AND PANCHROMATIC SENSITIVITY AND METHOD FOR THEIR MANUFACTURE

Paul M. Borsenberger, Hilton; Michael T. Regan, and William J. Staudenmayer, both of Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 674,197, Nov. 23, 1984, Pat. No. 4,578,334.

This application Aug. 5, 1985, Ser. No. 762,174

Int. Cl.[4] G03G *5/06, 5/14*

U.S. Cl. 430—130 **16 Claims**

1. A method for the manufacture of a multi-active photoconductive insulating element exhibiting very high electrophotographic speed and panchromatic sensitivity, said element having at least two active layers comprising a charge-generation layer in electrical contact with a charge-transport layer, which method comprises the steps of:

(1) depositing on an electrically-conductive support a substantially amorphous layer of N,N′-bis(2-phenethyl)perylene-3,4:9,10-bis(dicarboximide);

(2) overcoating said amorphous layer with a layer of a liquid composition comprising an organic solvent, a polymeric binder and an organic photoconductive material which is capable of accepting and transporting injected charge carriers from a charge-generation layer; and

(3) effecting removal of said organic solvent from said element; said liquid composition functioning to (A) form a charge-transport layer and (B) penetrate into said amorphous layer and convert said N,N′-bis(2-phenethyl)perylene-3,4:9,10-bis(dicarboximide) to a crystalline form, thereby forming a charge-generation layer that:

(a) contains a crystalline form of N,N'-bis(2-phenethyl)-perylene-3,4:9,10-bis(dicarboximide) which is capable, upon exposure to activating radiation, of generating and injecting charge carriers into said charge-transport layer,

(b) exhibits a first spectral absorption peak within the range of 420 to 470 nm and a second spectral absorption peak within the range of 610 to 630 nm, and

(c) has a prominent line at a 2θ angular position within the range of 22 to 25 degrees in the X-ray diffraction pattern obtained with CuK α radiation;

said charge-generation layer and said charge-transport layer co-acting to provide said photoconductive insulating element with the desired combination of very high electrophotographic speed and panchromatic sensitivity.

4,618,561

MONOMOLECULAR RECORD MEMORY MEDIUM WITH PHOTOSENSITIVE DIAZONIUM SALT

Hirohide Munakata; Yoshinori Tomida, both of Yokohama; Masahiro Haruta, Funabashi; Yutaka Hirai, Tokyo; Yukuo Nishimura, Sagamihara, and Takashi Hamamoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1984, Ser. No. 676,254
Claims priority, application Japan, Dec. 6, 1983, 58-229118
Int. Cl.[4] G03C *1/54, 1/58;* G03G *5/04;* G01D *15/14*
U.S. Cl. 430—156 14 Claims

1. A record memory medium comprising (a) a substrate and (b) a recording layer on said substrate which recording layer comprises a monomolecular film or monomolecular layer built-up film from about 4 to 10,000 angstroms in thickness of a photosensitive benzene diaxonium salt having a long-chain C_8 to C_{30} alkyl group as a side chain, said C_8 to C_{30} alkyl group being any one of saturated, unsaturated or substituted with an amino group or a carboxyl group, whereby said benzene diazonuim salt is capable of coupling with a coupling component to form an azo compound and whereby the medium, after photolysis and coupling reactions, is capable of being read out by light or photocurrent.

4. A record memory medium comprising (a) a substrate and (b) a recording layer on said substrate which recording layer comprises a monomolecular film or monomolecular layer built-up film from about 4 to 10,000 angstrom in thickness of a photosensitive benzene diazonium salt having a long-chain C_8 to C_{30} alkyl group as a side chain, said C_8 to C_{30} alkyl group being any one of saturated, unsaturated or substituted witn an amino group or a carboxyl group, and (c) photoconductive layer, whereby said benzene diazonium salt is capable of coupling with a coupling component to form an azo compound and whereby the medium, after photolysis and coupling reactions, is capable of being read out by light or photocurrent.

8. A record memory medium comprising (a) a substrate and (b) a recording layer on said substrate which recording layer comprises a monomolecular film or monomolecular layer built-up film from about 4 to 10,000 angstroms in thickness of (1) a photosensitive benzene diazonium salt having a long-chain C_8 to C_{30} alkyl group as a side chain, said C_8 to C_{30} alkyl group being, any one of saturated, unsaturated or substituted with an amino group or a carboxyl group, and (2) a coupling component whereby said benzene diazonium salt is capable of coupling with a coupling component to form an azo compound and whereby the medium, after photolysis and coupling reactions, is capable of being read out by light or photocurrent.

11. A record memory medium comprising (a) a substrate (b) a recording layer on said substrate which recording layer comprises a monomolecular film or monomolecular layer built-up film from about 4 to 10,000 angstroms in thickness of (1) a photosensitive benzene diazonium salt having a long-chain C_8 to C_{30} alkyl group as a side chain, said C_8 to C_{30} alkyl group being any one of saturated, unsaturated or substituted with an amino group or a carboxyl group, and (2) a coupling component and (c) photoconductive layer whereby said benzene diazonium salt is capable of coupling with a coupling component to form an azo compound and whereby the medium, after photolysis and coupling reactions, is capable of being read out by light or photocurrent.

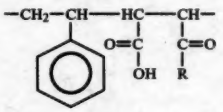
4,618,562

AQUEOUS DEVELOPABLE LITHOGRAPHIC PRINTING PLATES CONTAINING AN ADMIXTURE OF DIAZONIUM SALTS AND POLYMERS AND COMPOSITION THEREFOR

John E. Walls, Hampton, and Shuchen Liu, Clinton, both of N.J., assignors to American Hoechst Corporation, Somerville, N.J.

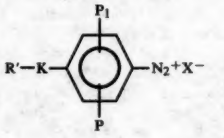
Filed Dec. 27, 1984, Ser. No. 686,778
Int. Cl.[4] G03C *1/60, 1/54, 1/94;* G03F *7/08*
U.S. Cl. 430—157 14 Claims

1. A photosensitive composition which comprises in admixture: a polyvinyl acetate resin having an average molecular weight in the range of from about 100,000 to less than about 800,000; a styrene end-capped co-polymer of the formula



wherein R is a lower aliphatic alcohol residue having from 1 to about 5 carbon atoms and wherein said polymer has an average molecular weight of not more than about 50,000; at least one light sensitive, negative working diazonium salt

Diazo 1 which is a light sensitive, substantially linear polymeric diazonium reaction compound comprising repeating units of the condensation product of each of the general types E^+X^- and Q, in which E^+X^- is a radical of the compound of the general formula:



wherein:

—K— is selected from the group consisting of

—S—, —O—, and $—CH_2—$, or is absent;

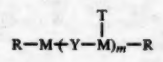
R' is selected from the group consisting of phenyl and C_1 to C_4 alkyl substituted phenyl;

P and P_1 are selected from the group consisting of C_1 to C_4 alkyl, methoxy, ethoxy, butoxy, or H;

P_1 may be the same as P or different; and

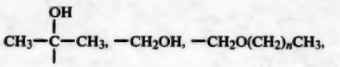
X^- is an anion;

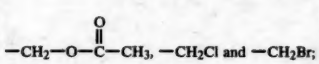
and Q is a radical of an oligomer having the structure:



wherein:

R is selected from the group consisting of





n is an integer from 0 to 3;

M is an aromatic radical selected from the group consisting of aromatic hydrocarbons, diaryl ethers, diaryl sulfides, diaryl sulfones, diaryl amines, diaryl ketones and diaryl diketones;

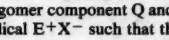
m is 1 to 6;

Y is selected from the group consisting of $-CH_2-$ or $-CH_2-O-CH_2-$bridge; and

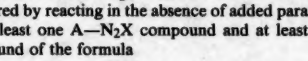
T is the same as R when Y=$-CH_2-$ and H— when Y=$-CH_2-O-CH_2-$

wherein said diazonium compound is prepared by a two-step process consisting essentially of forming a precondensed oligomer component Q and reacting said component Q with radical E^+X^- such that the ratio of M to E^+X^- is at least 2:1; and at least one light sensitive, negative working diazonium salt

Diazo 2 which is a light sensitive diazonium compound prepared by reacting in the absence of added paraformaldehyde at least one $A-N_2X$ compound and at least one B_1 compound of the formula



in which $A-N_2X$ is a radical of a compound selected from the group consisting of a compound of the formula



wherein

R_1 is a phenyl or naphthyl group

R'_1 is a phenylene or naphthylene group

R_2 is a phenylene group

R_3 is a single bond or one of the groups

$-(CH_2)_q-NR_4-$

$-O-(CH_2)_r-NR_4-$

$-S-(CH_2)_r-NR_4-$

$-S-CH_2-CO-NR_4-$

$-O-R_5-O-$

$-O-$

$-S-$ or

$-CO-NR_4-$

the left-hand free valence of the specified groups is attached to R_1 and the right-hand free valence is attached to R_2,

wherein

q is a number from 0 to 5

r is a number from 2 to 5

R_4 is selected from the group consisting of hydrogen, alkyl with 1 to 5 carbon atoms, aralkyl with 7 to 12 carbon atoms, and aryl with 6 to 12 carbon atoms,

R_5 is an arylene group having 6 to 12 carbon atoms

Y is one of the groups —NH—, and —O—

X is an anion

p is a number from 1 to 3

E is a radical obtained by splitting off of m H atoms from a compound free of diazonium group selected from the group consisting of aromatic amines, phenols, thiophenols, phenyl ethers, aromatic thioethers, aromatic heterocyclic compounds, aromatic hydrocarbons and organic acid amides,

R_a is selected from the group consisting of hydrogen and phenyl,

R_b is selected from the group consisting of hydrogen, alkyl,

wherein n is from 0 to 3 and a phenyl group, and

m is an integer from 1 to 10

in a strongly acidic condensation medium and under condensation conditions sufficient to produce a polycondensation product of an aromatic diazonium compound containing, on the average, about 0.1 to 50 B_1 units per unit of $A-N_2X$, wherein the total amount of the diazonium compounds ranges from about 20% to about 50% by weight of the composition, and the ratio of Diazo 1 to Diazo 2 is in the range of 1 to about 0.95–1.45; and wherein the polyvinyl acetate resin is present in the amount of from about 8% to about 33%; and wherein the styrene/maleic acid half ester copolymer is present in an amount of from about 25% to about 55% by weight of said composition.

10. A lithographic printing plate which comprises an aluminum containing substrate and the composition of claim **1** coated on said substrate.

4,618,563

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Mitsunori Ono; Isamu Itoh, and Keiji Mihayashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

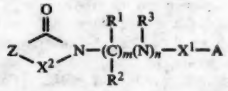
Filed Aug. 15, 1984, Ser. No. 641,101

Claims priority, application Japan, Aug. 15, 1983, 58-148980

Int. Cl.[4] **G03C** *1/40, 5/54, 1/08, 1/34*

U.S. Cl. 430—219 **34 Claims**

1. A silver halide photographic light-sensitive material comprising a support having thereon a light-sensitive silver halide emulsion layer having associated therewith a blocked photographic agent represented by formula (I)



(I)

wherein A represents a photographically useful agent moiety; X^1 represents a carbonyl group, a sulfonyl group, or a sulfinyl group, X^1 being bonded to A through a heteroatom, and X^2 represents a carbonyl group; Z represents an atomic group forming a 5-membered, 6-membered, or 7-membered ring; R^1 and R^2 each represents a hydrogen atom, a halogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group, an alkoxy group, an acyl group, a sulfonyl group, or a heterocyclic group; R^3 represents an alkyl group, an alkenyl group, a cycloalkyl group, a heterocyclic group, an aryl group, or an aralkyl group; m represents 0, 1, or 2; n represents 0 or 1; and the total of m+n is 1, 2, or 3.

18. A silver halide photographic light-sensitive material as in claim **1**, wherein the blocked photographic agent is present in a coloring material layer, a subbing layer, a protective layer, an interlayer, a filter layer, an antihalation layer, an image-receiving layer or a cover sheet layer.

4,618,564

PROCESS FOR PRODUCTION OF POSITIVE IMAGES USING SULFONIC ACID PRECURSORS

Christopher G. Demmer, Cherry Hinton, and Edward Irving, Burwell, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 24, 1985, Ser. No. 738,197

Claims priority, application United Kingdom, May 25, 1984, 8413395

Int. Cl.[4] G03C *1/495, 5/16*

U.S. Cl. 430—270 20 Claims

1. A process for the production of an image comprising

(i) forming a composition which comprises

(A) a film-forming organic material consisting essentially of an aqueous base-soluble material having a phenolic hydroxyl group or a carboxylic, sulfonic, phosphonic or phosphoric acid group, and

(B) a substance which releases a sulfonic acid on exposure to actinic radiation, thereby effecting a reduction of the dissolution rate of said film-forming material in aqueous base, and

(ii) exposing said composition to actinic radiation in a predetermined pattern, thereby nullifying said dissolution rate reduction to render the composition more soluble in an aqueous base developer in exposed areas than in unexposed areas, and

(iii) removing the composition in the exposed areas by treatment with the aqueous base developer.

11. A photosensitive composition, suitable for carrying out the process of claim 1, which comprises

(A) a film-forming organic material consisting essentially of an aqueous base-soluble material having a phenolic hydroxyl group or a carboxylic, sulfonic, phosphonic or phosphoric acid group, and

(B) a substance which releases a sulfonic acid on exposure to actinic radiation,

the composition being substantially free from ethylenically unsaturated material which is polymerized by means of free radicals and from material which is polymerized by sulfonic acids.

4,618,565

ABSORPTIVE LAYER FOR OPTICAL LITHOGRAPHY

Lawrence K. White, W. Windsor Township, Mercer County; Nancy A. Miszkowski, and Aaron W. Levine, both of Lawrenceville Township, Mercer County, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 5, 1985, Ser. No. 741,358

Int. Cl.[4] G03C *5/16, 1/84, 1/76*

U.S. Cl. 430—271 11 Claims

1. A multilayer resist recording medium disposed on a substrate comprising a planarizing layer overlying the substrate, an absorptive layer overlying the planarizing layer and a photoresist layer overlying the absorptive layer, wherein the absorptive layer comprises poly(methylmethacrylate) or a copolymer of methylmethacrylate and methacrylic acid, and a dye that is absorptive at the light frequency used to irradiate the photoresist layer and that is insoluble in the solvent for the photoresist layer.

7. A process for forming a relief pattern on a substrate comprising:

(a) coating the substrate with a composition comprising poly(methylmethacrylate) or a copolymer of methylmethacrylate and methacrylic acid, a suitable dye and a solvent therefor;

(b) drying the coating to form an absorptive layer;

(c) applying thereover a coating of a photoresist composition comprising a light-sensitive resist material and a solvent therefor, the solvent being a nonsolvent for the dye so that substantially no dye is dissolved into the photoresist layer;

(d) drying said coating to form a photoresist layer;

(e) irradiating and developing the photoresist layer, thus exposing a portion of the absorptive layer; and

(f) plasma etching the exposed portion of the absorptive layer in an oxygen plasma, thus exposing a corresponding portion of the substrate.

4,618,566

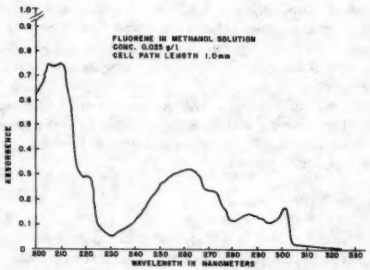
FLUORENE CONTAINING COMPOUNDS AND NEGATIVE PHOTORESIST COMPOSITIONS THEREFROM

James E. Guillet, Dons Mills, and Anthony E. Redpath, Toronto, both of Canada, assignors to Ecoplastics Limited, Willowdale, Canada

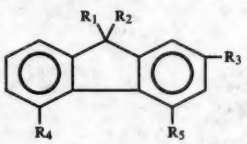
Filed Oct. 31, 1984, Ser. No. 666,592

Int. Cl.[4] G03C *1/71, 1/76;* C08F *8/00*

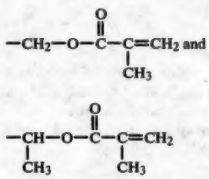
U.S. Cl. 430—271 5 Claims



1. An article of manufacture comprising an integrated circuit substrate element having applied thereon a thin homogeneous film sensitive in the deep UV light range of a composition comprising a ploymer of a fluorene monomer selected from the group consisting of monomers of the formula:



wherein R_1, R_2 and R_3 are the same of different substituents and are selected from the group consisting of hydrogen, alkyl radicals or 1 to 6 carbon atoms,

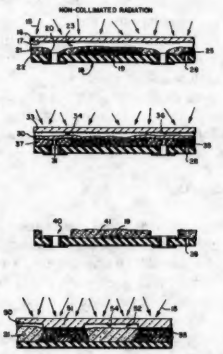


radicals and at least one R_1, R_2 and R_3 having a polymerizable $>C=C<$, group, and R_4 and R_5 are the same or different substituents are selected from the group consisting of hydrogen and alkyl radicals containing 1 to 6 carbon atoms, and copolymers of these fluorene monomers wherein the fluorene monomer is present in amounts of at least 2 percent by weight.

4,618,567
HIGH RESOLUTION LIQUID PHOTOPOLYMER COATING PATTERNS OVER IRREGULAR PRINTED WIRING BOARD SURFACE CONDUCTORS

Donald F. Sullivan, 115 Cambridge Rd., King of Prussia, Pa. 19406

Filed Jan. 14, 1985, Ser. No. 690,998
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—311 **12 Claims**



1. The method of photoprinting the non-collimated radiation high resolution printed wiring board patterns on a liquid photopolymer layer of pastelike consistency over conductive surfaces disposed on a printed wiring board insulating substrate, comprising the steps of: (1) placing a phototransparency sheet having opaque and transparent patterns thereon defining a desired pattern image in substantially a parallel plane over said liquid photopolymer layer of a type having the property that the radiation required to cure it is greater when its surface is exposed to air for photoimaging a pattern upon the photopolymer layer by means of radiation from an uncollimated source passing through the phototransparency onto the photopolymer layer, (2) providing at the opaque photo pattern locations an air gap separation between the phototransparency sheet and the photopolymer layer to inhibit by the air surface the curing of the photopolymer areas defined by the opaque portions of the phototransparency in response to any stray radiation resulting from the use of an uncollimated radiation source, and, (3) photoexposing the photopolymer layer by passing uncollimated radiation of enough intensity to solidify only part of the liquid polymer layer adjacent the substrate and not exposed to air in response to the image by polymerization through the phototransparency sheet transparent patterns with the air gap separation providing an inhibition of the polymerization at the image positions on surface of the photopolymer layer exposed to air so that liquid polymer remains in surface positions defined by the opaque patterns of the phototransparency sheet.

4,618,568
CHEMICAL METALLIZATION PROCESS WITH RADIATION SENSITIVE CHROMIUM (III) COMPLEX

Armin Gemmler, Blaubeuren-Weiler, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 16, 1984, Ser. No. 661,336
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1983, 3337790
Int. Cl.[4] G03C *5/24, 5/22*
U.S. Cl. 430—417 **10 Claims**

1. In a chemical metallization process in which a radiation sensitive sensitizer is applied to an electrically insulating surface to form a radiation sensitive layer on the surface, the layer is exposed to radiation to activate at least selected regions of the layer, and a salt solution of a catalytically effective metal is applied to the layer and metal is deposited from the solution in an external current-free manner to form a metal coating at the activated regions of the layer, the improvement wherein the sensitizer is oxidation agent-free and contains at least one noble metal salt and at least one chromium (III) complex compound whose ligands are a reducing agent or, when exposed to light, form a reducing agent for at least chromium(III) ions, to produce chromium(II) ions which in turn reduce noble metal ions contained in the noble metal salt, thereby forming noble metal nuclei which act as centers for the current-free metal deposition.

4,618,569
METHOD FOR PROCESSING OF SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Masayuki Kurematsu, and Shigeharu Koboshi, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1985, Ser. No. 721,568
Claims priority, application Japan, Apr. 17, 1984, 59-77813
Int. Cl.[4] B01D *15/06*; G03C *5/24, 7/40*
U.S. Cl. 430—428 **21 Claims**

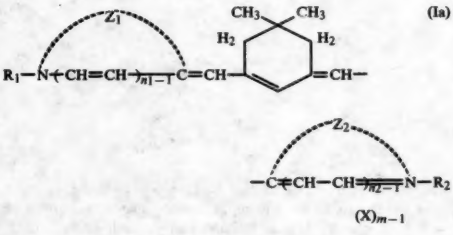
1. A method for processing of a silver halide photographic material which comprises carrying out stabilizing processing of a silver halide photographic material directly with a liquid stabilizer substantially without passing through the step of washing with water subsequent to the desilverization processing step, wherein processing is conducted while at least one of (i) contacting the liquid stabilizer with an ion-exchange resin or (ii) at least a part of the overflow liquid stabilizer after contacting the ion-exchange resin is used as the liquid stabilizer to prevent yellow stains in the photographic material immediately after processing or during storage thereafter.

4,618,570
SILVER HALIDE PHOTOGRAPHIC MATERIALS

Takashi Kadowaki, and Kaoru Onodera, both of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 712,342
Claims priority, application Japan, Mar. 27, 1984, 59-60421; Mar. 28, 1984, 59-61396
Int. Cl.[4] G03C *1/40, 1/30, 1/02*
U.S. Cl. 430—505 **16 Claims**

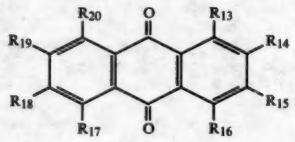
1. A silver halide color photographic material having one layer of silver halide emulsion layers containing a silver halide having a silver chloride content of not less than 25 molar % and a color coupler, characterized in that at least one of said silver halide emulsion layers contains a silver halide sensitized with a compound having at least one of the following formula (Ia), and the following formula (Ib) and is hardened with a compound having at least one of the following formula (II) and a compound having the formula (III);



(Ia)

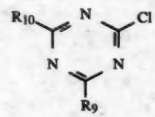
wherein each of R_1 and R_2 represents an alkyl group; each of Z_1 and Z_2 represents a nonmetallic atom group for forming a 5- or 6-membered nitrogen-containing heterocyclic ring; X repre-

sents an anion; each of n_1 and n_2 is 1 or 2; and m is 1 or 2 provided that, when an inner salt is formed, m is 1;


(Ib)

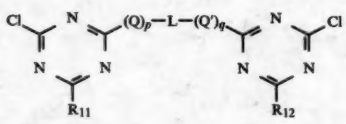
wherein each of R_{13}, R_{16}, R_{17} and R_{20} represents a hydrogen atom, a hydroxy group, a group of —OR or a group of

in which R is an alkyl or aryl group and each of R′ and R″ is a hydrogen atom or an alkyl or aryl group having at least one of a sulfonic acid group or a carboxylic acid group; and each of R_{14}, R_{15}, R_{18} and R_{19} represents a hydrogen atom, a sulfonic acid group, a carboxylic acid group or an alkyl or aryl group having at least one of a sulfonic acid group or a carboxylic acid group;


(II)

wherein R_9 represents a chlorine atom, a hydroxyl group, an alkyl group, an alkoxy group, a group of

in which each of R_{91} and R_{92} is a hydrogen atom, an alkyl group or an aryl group, a group of 13 $NHCOR_{93}$, in which R_{93} is a hydrogen atom, an alkyl group, an aryl group or an alkylthio group, or a group of —OH, in which M is a monovalent metal atom; and R_{10} is the same as R_9 except for a chlorine atom;


(III)

wherein each of R_{11} and R_{12} represents a chlorine atom, a hydroxyl group, an alkyl group, an alkoxy group or a group of —OM, in which M is as defined above; each of Q and Q′ represents a binding group of —O—, —S— or —NH—; L represents an alkylene group of an arylene group; and each of p and q is 0 or 1.

4,618,571

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Seiji Ichijima; Hideo Usui, and Naoyasu Deguchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 25, 1985, Ser. No. 705,473

Claims priority, application Japan, Feb. 23, 1984, 59-33059

Int. Cl.[4] G03C *1/46, 7/30, 7/32, 7/26*

U.S. Cl. 430—505 **22 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer, the color photographic light-sensitive material containing a coupler which releases a compound after the coupling reaction with the oxidation product of a developing agent, the released compound further releasing a photographically useful group by an oxidation-reduction reaction with the oxidation product of a developing agent, wherein the coupler is represented by the following general formula (I):

A—RED—PUG (I)

wherein A represents a coupler residue which releases the RED—PUG group upon the coupling reaction with the oxidation product of a developing agent; RED represents a group which releases the PUG group after the oxidation-reduction reaction with the oxidation product of a developing agent after the bonding to A is cleaved selected from the group consisting of a hydroquinone, a catechol, a naphthohydroquinone, an o-amino or p-amino phenol or a bisphenol; and PUG represents a group which exerts a substantial photographic function after the bonding to RED is cleaved.

4,618,572

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Keiji Mihayashi; Hidetoshi Kobayashi, and Shunji Takada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 12, 1984, Ser. No. 680,632

Claims priority, application Japan, Dec. 15, 1983, 58-237108

Int. Cl.[4] G03C *7/26*

U.S. Cl. 430—543 **19 Claims**

1. A silver halide photographic light-sensitive material comprising a support having provided thereon at least one silver halide emulsion layer and containing, in a silver halide emulsion layer having an average iodide content of about 10 mol% to about 30 mol%, a compound capable a development accelerator or a precursor thereof upon development in proportion to the amount of developed silver.

4,618,573

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Hisashi Okamura; Hidetoshi Kobayashi; Toshihiro Nishikawa, and Koji Tamoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

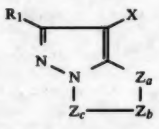
Filed May 10, 1985, Ser. No. 732,770

Claims priority, application Japan, May 10, 1984, 59-093604

Int. Cl.[4] G03C *7/32, 1/30*

U.S. Cl. 430—558 **19 Claims**

1. A silver halide color photographic material containing a hardener capable of exerting a hardening effect through activation of a carboxyl group and a magenta coupler of the pyrazoloazole type represented by formula (I)


(I)

wherein R_1 represents a hydrogen atom or a certain substituent group; X represents a hydrogen atom or a group capable of being split off by a coupling reaction with an oxidized aromatic primary amine developing agent; and Z_a, Z_b and Z_c each represents a methine group, a substituted methine group, =N— or —NH—; or the pyrazoloazole type coupler is a dimeric coupler, a polymeric coupler or a macromolecular coupler, each having a unit of the pyrazoloazole compound represented by the formula (I).

4,618,574

HIGH CONTRAST PHOTOGRAPHIC ELEMENTS EXHIBITING REDUCED PEPPER FOG

Anthony Cavallaro, East Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 18, 1985, Ser. No. 756,158
Int. Cl.[4] G03C *1/34*
U.S. Cl. 430—567 **18 Claims**

1. A negative working photographic element capable of producing a high contrast silver image comprised of

a support,

a contrast enhancing arylhydrazide, and

a gelatino-silver halide emulsion layer comprised of surface latent image forming monodispersed silver halide grains having a mean diameter of less than 0.7 μm,

further characterized in that said emulsion layer contains in an amount sufficient to reduce pepper fog while maintaining high contrast a polyhydroxybenzene and a carboxyalkyl-3H-thiazoline-2-thione.

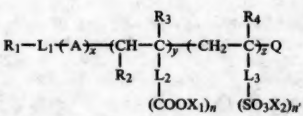
4,618,575

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yukio Maekawa, and Yasuo Mukunoki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 3, 1985, Ser. No. 719,396
Claims priority, application Japan, Apr. 3, 1984, 59-66465
Int. Cl.[4] G03C *1/38*
U.S. Cl. 430—634 **14 Claims**

1. A silver halide photographic light-sensitive material comprising a hydrophilic organic colloid layer, wherein the hydrophilic organic colloid layer contains at least one compound represented by formula (I)

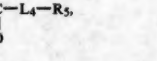


(I)

wherein

R_1 represents a substituted or unsubstituted alkyl or aromatic group:

R_2 represents a hydrogen atom or



wherein L_4 represents a divalent bonding group, and R_5 represents a hydrogen atom or a substituted or unsubstituted alkyl or aromatic group;

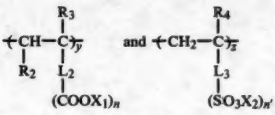
R_3 and R_4 each represents a hydrogen atom, or a substituted or unsubstituted alkyl group;

L_1 represents a divalent bonding group selected from —S— and —SO_2—;

L_2 and L_3 each represents a single bond or a divalent or trivalent bonding group;

n and n' each represents an integer of 1 or 2;

A represents a repeating unit resulting from polymerization of an ethylenically unsaturated monomer copolymerizable with monomers constituting the units



wherein X_1 and X_2 each represents a hydrogen atom or a cation;

x, y, and z are each an average number of units derived from respective monomers, with x being greater than 0 and at least one of y and z being greater than 0; and

Q represents a monovalent group.

4,618,576

DIAGNOSTIC TEST FOR STREPTOCOCCUS A

Robert Rosenstein, Ellicott City; Kim P. Aspden, Reisterstown, and Peter Stopa, Timonium, all of Md., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Feb. 27, 1984, Ser. No. 584,175
Int. Cl.[4] G01N *33/53*; C12Q *1/04*; C12M *1/40, 1/30*
U.S. Cl. 435—7 **12 Claims**

7. A method for detecting Streptococcus A comprising

providing an applicator including an applicator stick with a fibrous swab and swabbing a biological sample with said swab,

providing an extraction reagent containing enzymes produced by *S. albus* for effecting release of Streptococcus A antigen from said swab, dipping said swab in said extraction reagent and incubating said swab within said extraction reagent for a period of time sufficient to release antigen from said fibrous swab,

providing indicator reagent containing antibody reactive with said antigen and adding an aliquot of said extraction reagent thereto, and

noting the occurrence or nonoccurrence of an antibody-antigen reaction, indicating the presence or absence of Streptococcus A in said biological sample.

4,618,577

HUMAN-HUMAN HYBRIDOMA, CLNH5

Harold H. Handley, Cardiff-by-the-Sea; Mark C. Glassy, San Diego, both of Calif.; Yoshihide Hagiwara, Hyogo, and Hideaki Hagiwara, Osaka, both of Japan, assignors to The Regents of The University of California, Berkeley, Calif.

Filed Feb. 9, 1983, Ser. No. 465,081
Int. Cl.[4] G01N *33/53*; C12P *21/00*; C12N *15/00, 5/00*; C12R *1/91*
U.S. Cl. 435—7 **11 Claims**

1. A human hybridoma designated CLNH5 having A.T.C.C. Accession No. HB8206.

4,618,578

EXPRESSION OF GLYCOPROTEIN D OF HERPES SIMPLEX VIRUS

Rae L. Burke; Mickey S. Urdea, and Pablo D. T. Valenzuela, all of San Francisco, Calif., assignors to Chiron Corporation, Emeryville, Calif.

Filed Jul. 17, 1984, Ser. No. 631,669
Int. Cl.[4] C12P *21/00*; C12N *15/00, 1/00*; C07H *21/04*
U.S. Cl. 435—68 **30 Claims**

1. An improved method for producing a polypeptide which is immunologically cross-reactive with glycoprotein D of herpes simplex virus, said method comprising:

growing a yeast host which has been modified to include a DNA sequence expressing a polypeptide of at least nine amino acids defining at least one epitopic site found in naturally-occurring glycoprotein D; and

collecting the polypeptide produced by the yeast host.

4,618,579

RAW STARCH SACCHARIFICATION

Bruce L. Dwiggins; Carl E. Pickens, both of Decatur, and Carl W. Niekamp, Forsyth, all of Ill., assignors to Genencor, Inc., South San Francisco, Calif.

Filed Sep. 28, 1984, Ser. No. 656,051

Int. Cl.[4] C12P *19/20, 19/14;* **C12N** *9/34;* **C12R** *1/645*

U.S. Cl. 435—96 **24 Claims**

1. A method of preparing a syrup containing, on a dry substance weight basis, a high percentage of glucose, said method comprising:

(a) preparing a first aqueous slurry of granular starch containing between about 20 and about 60 weight percent starch, d.s.;

(b) adjusting the pH and the temperature of said first slurry to values suitable to promote activity of a raw starch hydrolyzing enzyme preparation which is produced by a fungal organism and which catalyzes the hydrolysis of granular starch directly to glucose, said raw starch hydrolyzing enzyme preparation being characterized in that it catalyzes the hydrolysis of granular starch suspended in water at a concentration of about 15 percent by weight starch solids substantially completely to soluble glucose syrup solids containing at least about 97 percent by weight glucose, d.s., when the hydrolysis is carried out at a pH of about 5.0 to about 7.0 and a temperature of about 55° C. and without added alpha amylase or added debranching enzyme of the pullulanase, isoamylase or beta amylase type, said enzyme preparation being further characterized in that it is separable by carboxymethyl cellulose into a first adsorbing fraction and a second non-adsorbing proteinaceous fraction, said first adsorbing fraction containing a glucoamylase enzyme (EC 3.2.1.3) that has an isoelectric point of about 8.0 or higher and said second non-adsorbing fraction having glucoamylase-protentiating activity that catalyzes the hydrolysis of granular starch;

(c) adding to said first slurry the raw starch hydrolyzing enzyme preparation in an amount sufficient to solubilize and saccharify a substantial portion of the starch in said first slurry;

(d) allowing said raw starch hydrolyzing enzyme preparation to solubilize and saccharify a substantial portion, but less than all, of the starch in said first slurry to yield a first syrup of at least about 22 weight percent saccharides, d.s.;

(e) separating said first syrup from the insolubles which remain and which contain unsolubilized starch from said first slurry;

(f) preparing a second aqueous slurry from said insolubles, said second slurry containing less than about 20 weight percent, d.s., starch;

(g) adjusting the pH and the temperature of said second slurry to values suitable to promote raw starch hydrolyzing enzyme activity;

(h) contacting said second slurry with the raw starch hydrolyzing enzyme preparation in an amount sufficient to solubilize and saccharify substantially all of the starch contained in said second slurry;

(i) allowing said raw starch hydrolyzing enzyme preparation to solubilize and saccharify substantially all of the starch in said second slurry to provide a second syrup; and

(j) separating said second syrup from insolubles contained therein.

4,618,580

PROCESS FOR THE PRODUCTION OF L-TRYPTOPHAN USING SULFAGUANIDINE-RESISTANT MICROORGANISMS

Isamu Shiio, Kamakura; Shinichi Sugimoto, and Kazue Kawamura, both of Kawasaki, all of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 599,922

Claims priority, application Japan, Apr. 13, 1983, 58-65010; Dec. 23, 1983, 58-243572

Int. Cl.[4] C12P *13/22;* **C12R** *1/13, 1/15*

U.S. Cl. 435—108 **2 Claims**

1. A method for producing L-tryptophan by fermentation, which comprises:

culturing aerobically in a culture medium *Corynebacterium glutamicum* FERM-BP 478 or *Brevibacterium flavum* FERM-BP 475 which are resistant to sulfaguanidine and capable of producing L-tryptophan; and

recovering the L-tryptophan which has accumulated in the culture medium.

4,618,581

CLAVINE-PRODUCING STRAIN, A PROCESS FOR THE PREPARATION THEREOF AS WELL AS A MICROBIOLOGICAL PROCESS FOR PRODUCING CLAVINE ALKALOIDS

Mária Trinn, Pecs; Gabriella Kordik, Budapest; Eva Udvardy-Nagy née Cserey Pecháany, Budapest; Zsuzsanna Vida, Budapest, and Rzsebet Zsóka née Sómkuti, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT., Budapest, Hungary

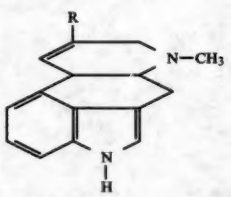
Filed Aug. 3, 1984, Ser. No. 637,524

Claims priority, application Hungary, Aug. 10, 1983, 2817/83

Int. Cl.[4] C12P *17/18;* **C12N** *15/00, 1/14*

U.S. Cl. 435—119 **5 Claims**

1. A microbiological process for the preparation of clavine alkaloids of the Formula (I)



(I)

wherein R stands for a methyl or a hydroxymethyl group, by culturing a *Claviceps fusiformia* strain in a liquid submerged culture medium containing sources of carbon, nitrogen, and mineral salts, under aerobic conditions, which comprises using a *Claviceps fusiformia* variant strain deposited under No. 00211 as alkaloid producing strain on Nov. 15, 1981 at the National Collection of Microorganisms, National Institute for Public Health, Budapest, Hungary, and recovering the alkaloids obtained.

4,618,582

PROCESS FOR PRODUCING XANTHOMONAS BIOPOLYMERS

Konrad Engelskirchen, Meerbusch; Werner Stein, Düsseldorf; Michael Bahn, Hilden; Ludwig Schieferstein, Oberhausen; Joachim Schindler, Hilden, and Rolf Schmid, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,591

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1981, 3105556

Int. Cl.[4] C12P *19/06;* C12N *1/26, 1/20;* C12R *1/64*

U.S. Cl. 435—104 10 Claims

1. In the method of conducting a fermentation reaction wherein an aqueous culture medium comprising a carbohydrate source and a nitrogen source is inoculated with a polysaccharide gum producing Xanthomonas microorganism and said medium is mechanically agitated and aerated under conditions to effect fermentation thereof, the improvement which comprises said culture medium being dispersed via a surfactant in about 15 to about 90%, based on the total weight of dispersion, of a water insoluble oil in which the resultant polysaccharide is also insoluble.

4,618,583

METHOD OF PREPARING L-(+)-β-HYDROXYISOBUTYRIC ACID BY FERMENTATION

Robert S. Robison, North Brunswick, and Michael G. Doremus, South Bound Brook, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 19, 1984, Ser. No. 672,984

Int. Cl.[4] C12P *7/42*

U.S. Cl. 435—146 16 Claims

1. A method for producing L-(+)-β-hydroxyisobutyric acid, which comprises subjecting a substrate which is isobutyric acid, methacrylic acid, isobutyryl chloride, the methyl ester of isobutyric acid, the ethyl ester of isobutyric acid, the methyl ester of methacrylic acid, the ethyl ester of methacrylic acid, isobutyl alcohol, esters of isobutyl alcohol, isobutyl amine, isobutyl aldehyde, isobutyl amide or mixtures of two or more thereof, to the action of a microorganism of the species *Pseudomonas aeruginosa* or of the species *Protaminobacter alboflavus* to convert the substrate into L-(+)-β-hydroxyisobutyric acid in an aqueous medium, and recovering L-(+)-β-hydroxyisobutyric acid from the medium.

4,618,584

ULTRAFILTRATION PURIFICATION OF GLUCOSE ISOMERASE

Richard A. Johnson; Richard L. Antrim, both of Clinton, Iowa, and Norman E. Lloyd, Ridgefield, Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Dec. 20, 1984, Ser. No. 684,205

Int. Cl.[4] C12N *9/92*

U.S. Cl. 435—234 20 Claims

1. A process for the production of a purified glucose isomerase enzyme which comprises contacting an enzyme extract containing glucose isomerase and impurities with a first polysulfone membrane not normally permeable to glucose isomerase, in the presence of a salt concentration capable of selectively inducing permeation of glucose isomerase through the membrane, and obtaining a glucose isomerase containing permeate.

4,618,585

HYBRIDOMA CELL LINES PRODUCING MONOCLONAL ANTIBODIES DIRECTED AGAINST CERVICAL CANCER CELLS

Teh-sheng Chan, League City, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Continuation of Ser. No. 359,514, Mar. 18, 1982, abandoned. This application Jul. 16, 1984, Ser. No. 631,252

Int. Cl.[4] C12N *5/00;* A61K *39/395;* C07K *15/00*

U.S. Cl. 435—240 2 Claims

1. A continuous hybrid cell line having ATCC deposit number HB8563 and clones thereof, which cell line produces monoclonal antibody to an antigenic determinant unique to HeLa cervical cancer cells.

4,618,586

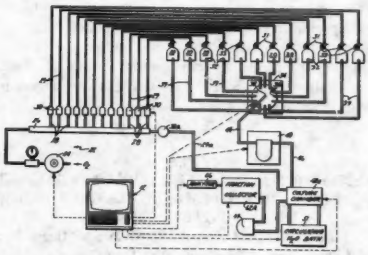
APPARATUS FOR ADMINISTERING A CONTROLLED DOSAGE OF A CHEMICAL SUBSTANCE HAVING AN IMPROVED CULTURE CHAMBER

Robert D. Walker, Ham Lake, Minn., assignor to Endotronics, Inc., Minneapolis, Minn.

Filed Apr. 8, 1983, Ser. No. 483,284

Int. Cl.[4] A01N *1/02;* C12M *1/36, 3/00*

U.S. Cl. 435—1 7 Claims



1. An apparatus for delivering a controlled dosage of a chemical substance to a chamber containing cells or tissue, the apparatus comprising:

a plurality of vessels, each vessel containing a different known concentration of the chemical substance;

valving means having a plurality of inlets and a single outlet for fluidly connecting a preselected inlet to the single outlet;

first conduit means for fluidly connecting the vessels to the inlets;

a culture chamber for receiving the chemical substance having a lower fluid chamber and an upper neck portion, the neck portion being of smaller diameter than the fluid chamber and the chemical substance having an upper level in the neck portion, the neck portion communicating with the fluid chamber and the culture chamber further including an inlet and a second conduit means having a lower end disposed within the neck portion defining a predetermined level of the chemical substance in the culture chamber;

third conduit means for fluidly connecting the single outlet of the valving means to the inlet of the culture chamber;

first pump means fluidly connected to the third conduit means for providing a transport force to the chemical substance in a flow controlled manner for delivering the chemical substance to the culture chamber;

second pump means fluidly connected to the second conduit means for removing excess volume of the chemical substance from the culture chamber and keeping the volume within the culture chamber constant; and

control means for controlling the valving means having means for providing input signals and means for providing signals indicative of a desired program of administation

such that a preselected inlet is fluidly connected to the outlet for presenting a preselected known concentration of the chemical substance to the chamber, and for controlling the first pump means for providing a transport force to the chemical substance, and for controlling the second pump means so that the volume in the chamber is kept constant, and including means for controlling the concentration of the chemical substance in the chamber according to the program of administration corresponding to the equation

$$C_{(t)}=C_s+(C_i-C_s)e^{-(Rt)/V}$$

wherein

t=integration time interval

V=volume of fluid within the culture chamber affecting the cells or tissue in which the chemical substance is being delivered

R=the rate of delivery of the chemical substance to the culture chamber

C_i=the initial concentration level of the chemical substance in the integration time interval within the culture chamber

$C_{(t)}$=the final concentration of the chemical substance in the integration time interval within the culture chamber

C_s=the concentration of the chemical substance being delivered in the integration time interval from the vessels into the culture chamber,

wherein the means for controlling the concentration selects values of R/V and C_s such that the concentration change between C_i and $C_{(t)}$ is linear.

4,618,587

METHOD FOR THE QUANTITATIVE DETERMINATION OF CALCIUM IN BIOLOGICAL FLUIDS THROUGH DIRECT POTENTIOMETRY

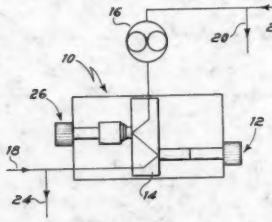
Pietro Premoli, Via S. Lorenzo 19, Andorno Micca, Vercelli, Italy 13061; Angelo Manzoni, Via Ugo Foscolo 22, Brugherlo, Milan, Italy 20047, and Claudio Calzi, Via Martiri Oscuri 21, Milan, Italy 20125

Filed Feb. 21, 1985, Ser. No. 703,649

Claims priority, application Italy, Feb. 28, 1985, 19826 A/84

Int. Cl.⁴ G01N *27/46, 33/48*

U.S. Cl. 436—74 **7 Claims**



1. In a method for the determination of calcium ion content of serum using a potentiometric system the improvement comprising the steps of calibrating the potentiometric system with a first calibrating solution containing about 0.001 molar calcium and a second calibrating solution containing about 0.003 molar calcium, the first and second calibrating solutions also containing about 0.1 molar tris(hydroxymethyl)aminomethane or derivatives thereof having a pH value of about 7.5 at about 25° C. and from about 300 to about 400 milligrams per deciliter of 2.2 Bis-(hydroxymethyl)-2,2',2''-nitrilotriethanol, and diluting a serum sample with a dilution solution containing 0.1 molar tris(hydroxymethyl)aminoethane having a pH value of about 7.5 at about 25° C.

4,618,588

REAGENT AND MERCHANDISING KIT FOR USE IN THE DIAGNOSIS OF SYPHILIS AND PREPARATION THEREOF

Takashi Sato, Saitama, and Emiko Kubo, Tokyo, both of Japan, assignors to Fujizoki Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 430,238

Claims priority, application Japan, Oct. 23, 1981, 56-168646

Int. Cl.⁴ G01N *33/571, 33/555, 33/531;* C12Q *1/04*

U.S. Cl. 436—511 **8 Claims**

1. In a regent for use in the diagnosis of syphilis by hemagglutination of an antigen obtained from a cultrure of pathogenic Treponema pallidum Nichols and wherein carrier particles are sensitized with said antigen, the improvement which comprises said antigen being subtantially devoid of proteinic fractions of said culture, said proteinic fractions having a specific gravity less than 1.01.

4,618,589

IMMUNOPRECIPITATION ASSAY OF IMMUNOGLOBULINS USING MONOCLONAL ANTIBODIES

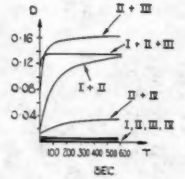
Royston Jefferis, Birmingham, England, and Jens Steensgaard, Aarhus, Denmark, assignors to The University of Birmingham, Birmingham, England

Continuation of Ser. No. 582,155, Feb. 24, 1984, abandoned, which is a continuation of Ser. No. 351,444, Feb. 23, 1982, abandoned. This application Jun. 19, 1985, Ser. No. 745,837

Claims priority, application United Kingdom, Jul. 16, 1980, 8023151

Int. Cl.⁴ G01N *33/541, 33/577*

U.S. Cl. 436—540 **6 Claims**



1. A method of quantification of a sub-population of an immunoglobulin having first and second sub-populations, said method comprising the steps of:

(a) reacting a first sample containing said immunoglobulin with first and second monoclonal antibody preparations which specifically bind to respective distinct antigenic sites on the macromolecule of said immunoglobulin, such that binding of one monoclonal antibody to its specific antigenic site does not intefere with the binding of the other antibody to its specific antigenic site, both of said sites being common to both of said first and second sub-populations, to obtain a first antigen-antibody precipitate;

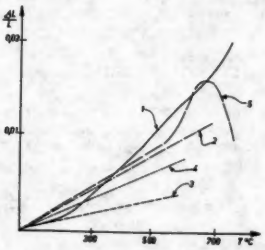
(b) reacting a second sample identical to said first sample with said first preparation and with a third monoclonal antibody preparation which specifically binds to an antigenic site expressed by only one of said first and second sub-populations, to obtain a second antigen-antibody precipitate; and

(c) determining from said second antigen-antibody precipitate the quantity of said first sub-population in the sample.

4,618,590
STARTING MIXTURE FOR A DIELECTRIC COMPOSITION

Hugues Baudry, Varennes-Jarcy, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 3, 1985, Ser. No. 730,220
Claims priority, application France, May 18, 1984, 84 07769
Int. Cl.[4] C03C *14/00, 8/14, 8/04*
U.S. Cl. 501—17 4 Claims



1. A starting mixture suitable for forming a dielectric composition consisting essentially of 85%–60% by volume of a vitreous phase and 15%–40% by volume of ceramic phases, said vitreous phase having the following composition by mol.%:

30–55% SiO_2, 15–30% ZnO, 15–40% BaO, 0–20% B_2O_3 and 0–10% Al_2O_3 and said ceramic phases consisting essentially in volume percent of:

ZnO-5–20%, Co_3O_4-0–10% and PbO_2-10–25%.

4,618,591
SILICON CARBIDE-CARBON COMPOSITE MOLDED PRODUCT AND PROCESS FOR MANUFACTURING THE SAME

Kiyohito Okamura; Yoshio Hasegawa, both of Ibaraki; Yoshiyasu Kuroo, Koganei, and Masana Ugaji, Tokyo, all of Japan, assignors to Sony Corporation and The Foundation: The Research Institute for Special Inorganic Materials, Tokyo, both of, Japan

Division of Ser. No. 557,183, Nov. 9, 1983, abandoned. This application Jun. 3, 1985, Ser. No. 740,475
Int. Cl.[4] C04B *35/56*
U.S. Cl. 501—90 10 Claims

1. A silicon carbide-carbon composite consisting of a matrix consisting essentially of SiC and having bonded therein an amorphous carbon, said composite having been produced by:

providing a molded base material composed of an organic polymer which is thermally decomposable to a fibrous carbon by high temperature treatment, said base material being shaped into a desired configuration,

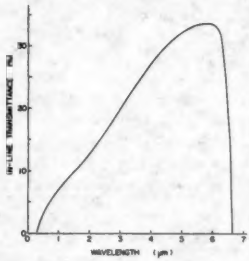
impregnating said base material with an organic silicon polymer having a molecular skeleton consisting mainly of carbon-silicon bonds,

burning the thus impregnated product at a temperature of at least 700° C. in the absence of oxygen to simultaneously (a) convert said organic silicon polymer to a matrix consisting mainly of SiC, (b) convert said base material mainly to fibrous carbon and (c) bond the two together by simultaneous shrinkage without separation during such burning.

4,618,592
FINE POWDER OF ALUMINUM NITRIDE, COMPOSITION AND SINTERED BODY THEREOF AND PROCESSES FOR THEIR PRODUCTION

Nobuyuki Kuramoto, Sagamihara, and Hitofumi Taniguchi, Chigasaki, both of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Continuation-in-part of Ser. No. 532,591, Sep. 15, 1983, abandoned. This application Mar. 12, 1984, Ser. No. 588,773
Claims priority, application Japan, Sep. 17, 1982, 57-160782; Sep. 17, 1982, 57-160783; May 13, 1983, 58-82536
Int. Cl.[4] C04B *35/58;* F27D *7/06*
U.S. Cl. 501—96 36 Claims



1. A fine powder of aluminum nitride

(a) having an average particle diameter of not more than 2 microns.

(b) comprising at least 97% by weight of aluminum nitride, and at most 0.5% by weight as metal of metal compounds as impurities, or at most 0.5% by weight, as impurities, of carbon or silicon as carbon or silicon compounds, wherein at most 0.1% by weight of the metal of the metal compounds is selected from the group consisting of iron, chromium, nicket, cobalt, copper, zinc and titanium, and

(c) containing at most 1.5% by weight of bound oxygen.

4,618,593
PROCESS FOR IMPROVING ACTIVITY OF TELLURIUM CONTAINING METAL OXIDE CATALYSTS

Yutaka Sasaki; Yutaka Kiyomiya, and Toshio Nakamura, all of Kanagawa, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed May 17, 1982, Ser. No. 379,205
Claims priority, application Japan, May 15, 1981, 56-73144; Feb. 15, 1982, 57-21095
Int. Cl.[4] B01J *27/30, 23/92;* C07C *121/32, 120/14*
U.S. Cl. 502—20 19 Claims

1. A regeneration process for tellurium containing metal oxide catalysts used in the process for oxidation, ammoxidation or oxidative dehydrogenation reaction of organic compounds at a temperature of about 300° C. to about 600° C. in a reactor using a metal oxide catalyst (A) having a composition, as defined in a freshly prepared state, represented by an empirical formula,

$$A_aTe_bC_cD_dE_eO_x$$

wherein A represents at least one element selected from the group consisting of Sb, Mo and V, Te represents tellurium, C represents at least one element selected from the group consisting of B, P, As, Bi, S and Se, D represents at least one element selected from the group consisting of Li, Na, K, Rb, Cs and Tl, E represents at least one element selected from the group consisting of Mg, Ca, Sr, Ba, Y, La, Ce, U, Ti, Zr, Nb, Ta, Cr, W, Mn, Re, Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu, Ag, Zn, Cd, Al, Ga, In, Ge, Sn and Pb, and O represents oxygen; and a, b, c, d, e and x represent the atomic ratios of the elements in the

formula for which they are subscripts, wherein a=10, b=0.01 to 5, c=0 to 10, d=0 to 5, e=0 to 60 and x is the number of oxygen corresponding to the oxides formed by combining the above described components, said catalyst has become partially deactivated during the reaction, said process comprising regenerating the deactivated catalyst at the reaction temperature under a non-reductive atmosphere by contacting the deactivated catalyst with a tellurium enriched metal oxide catalyst (B), represented by the same empirical formula as said metal oxide catalyst (A) except for the tellurium content, the tellurium content of said catalyst (B) being about 1% by weight or more and higher than that of freshly prepared metal oxide catalyst (A), said tellurium enriched metal oxide catalyst (B) being present in an amount of at least about 0.01% by weight based on said metal oxide catalyst (A).

9. A regeneration process for tellurium containing metal oxide catalyst used in the process for oxidation, ammoxidation or oxidative dehydrogenation reaction of organic compounds at a temperature of about 300° C. to about 600° C. in a reactor using a metal oxide catalyst (A) having a composition, as defined in a freshly prepared state, represented by the empirical formula,

$$A_aTe_bC_cD_dE_eO_x$$

wherein A represents at least one element selected from the group consisting of Sb, Mo and V, Te represents tellurium, C represents at least one element selected from the group consisting of B, P, As, Bi, S and Se, D represents at least one element selected from the group consisting of Li, Na, K, Rb, Cs and Tl, E represents at least one element selected from the group consisting of Mg, Ca, Sr, Ba, Y, La, Ce, U, Ti, Zr, Nb, Ta, Cr, W, Mn, Re, Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu, Ag, Zn, Cd, Al, Ga, In, Ge, Sn and Pb, and O represents oxygen; and a, b, c, d, e and x represent the atomic ratios of the elements in the formula for which they are subscripts, wherein a=10, b=0.01 to 5, c=0 to 10, d=0 to 5, e=0 to 60 and x is the number of oxygens corresponding to the oxides formed by combining the above described components, said catalyst having become partially deactivated during the reaction, said process comprising regenerating the deactivated catalyst at the reaction temperature under a non-reductive atmosphere by contacting the deactivated catalyst with a tellurium-molybdenum enriched catalyst system (C) represented by the same empirical formula as said metal oxide catalyst (A) except for both of the tellurium and molybdenum contents, and selected from the group consisting of (i) a physical blend of a tellurium enriched catalyst and a molybdenum enriched catalyst, and (ii) a tellurium-molybdenum enriched catalyst, the tellurium and molybdenum contents being higher than those of the freshly prepared metal oxide catalyst (A), respectively, the tellurium content of the tellurium-molybdenum enriched catalyst system (C) being about 1% by weight or more and higher than that of said metal oxide catalyst (A) and said tellurium-molybdenum enriched catalyst system (C) being present in an amount of a total of about 0.01% by weight or more based on said metal oxide catalyst (A).

19. A process according to claim 9, wherein deactivated catalyst (A) is blended with a dry tellurium-molybdenum-enriched catalyst or a dry blend of a tellurium-enriched catalyst and a molybdenum-enriched catalyst such that the increase in tellurium contained in the catalyst blend is from about 0.001 to 15% of the total catalyst weight, and the increase in molybdenum contained in the catalyst blend is from about 0.002 to 10% of the total catalyst weight.

4,618,594

CATALYST AND PROCESS FOR THE HYDRODENITROGENATION AND HYDROCRACKING OF HIGH-NITROGEN FEEDS

A. Martin Tait; Thomas D. Nevitt, both of Naperville, Ill., and Albert L. Hensley, Jr., Munster, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 669,655, Nov. 8, 1984, abandoned, which is a continuation-in-part of Ser. No. 200,536, Oct. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 181,433, Aug. 4, 1980, Pat. No. 4,306,965, which is a continuation of Ser. No. 21,575, Mar. 19, 1979, Pat. No. 4,224,144. This application Jan. 23, 1986, Ser. No. 821,843

Int. Cl.[4] B01J *29/28, 29/04, 21/00*

U.S. Cl. 502—66 23 Claims

1. A catalyst which comprises a hydrogenation component comprising chromium, molybdenum, and at least one Group VIII Metal, a crystalline molecular sieve zeolite selected from the group consisting of ZSM crystalline aluminosilicates and AMS crystalline metallosilicates, and containing exchangeable cations, and a porous refractory inorganic oxide, the metals of said hydrogenation component being present in the elemental form, as oxides, as sulfides, or mixtures thereof.

4,618,595

POLYMERIZATION OF OLEFINS

Richard E. Dietz, Bartlesville, Okla., assignor to Phillips Petrolem Company, Bartlesville, Okla.

Continuation of Ser. No. 680,688, Dec. 12, 1984, abandoned, which is a continuation of Ser. No. 380,788, May 21, 1982, abandoned. This application Jun. 5, 1985, Ser. No. 742,168

Int. Cl.[4] C08F *4/02, 4/64*

U.S. Cl. 502—108 33 Claims

3. A process comprising precipitating a product in the presence of a particulate diluent which comprises polyolefin fibrils suspended in a solution of metal halide compound and transition metal compound wherein the metal halide compound comprises a metal dihalide or metal hydroxyhalide and the metal of the metal halide compound is selected from the group consisting of Group IIA and Group IIB metals and the transition metal compound contains a transition metal compound selected from Group IVB and VB and the transition metal is bonded to at least one atom selected from the group consisting of oxygen, nitrogen and sulfur and said oxygen, nitrogen and sulfur atoms are in turn bonded to a hydrocarbyl group containing from 1 to about 20 carbon atoms.

7. A process as in claim 3 further comprising polymerizing an effective amount of an alpha-olefin onto the catalyst to form an improved catalyst.

4,618,596

POLYMERIZATION CATALYST, PRODUCTION AND USE

Agapios K. Agapiou, Humble; Michael E. Muhle, Kingwood, and Myron B. Kurtzman, Houston, all of Tex., assignors to Exxon Chemical Patents Inc., Florham Park, N.J.

Filed Jul. 26, 1985, Ser. No. 759,202

Int. Cl.[4] C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—116 40 Claims

1. A transition metal-containing catalyst component comprising the solid reaction product obtained by treating an inert solid support material in an inert solvent with (A) Cl_2, Br_2 or an interhalogen, (B) an organometallic compound of a Group IIa, IIb or IIIa metal wherein all the metal valencies are satisfied with a hydrocarbon selected from alkyl, aryl, cycloalkyl, aralkyl, alkadienyl or alkenyl groups having from 1 to 20 carbon atoms, (C) an oxygen-containing compound selected from ketones, adehydes, alcohols, siloxanes or mixtures thereof, (D) at least one transition metal compound of a Group IVb, Vb, VIb or VIII metal, and (E) prereducing the transition metal-containing component with an organo-metallic compound of a Group IIa, IIb or IIIa metal, with the proviso that

the inert support is first contacted with (A) Cl_2, Br_2 or interhalogen and the (B) and (C) ingredients can be added to the inert solid (i) simultaneously, (ii) as the reaction product of (B) and (C), or (iii) treatment of the inert solid with (C) immediately precedes treatment with (B).

4,618,597

HIGH SURFACE AREA DUAL PROMOTED IRON/MANAGANESE SPINEL COMPOSITIONS

Rocco A. Fiato, Scotch Plains, and Stuart L. Soled, Pittstown, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 564,465, Dec. 20, 1983. This application Dec. 27, 1985, Ser. No. 814,040

Int. Cl.[4] B01J *23/02, 23/34*

U.S. Cl. 502—324 **16 Claims**

1. A composition of matter comprising an unsupported, Group IA or IIA metal and copper promoted, single phase, iron-manganese spinel, said spinel exhibiting a powder X-ray diffraction pattern substantially isostructural with Fe_3O_4, and possessing a BET surface area greater than 30 M^2/g and an iron-manganese atomic ratio greater than about 2:1.

4,618,598

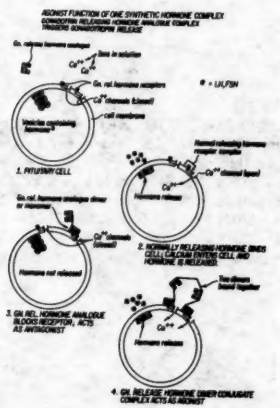
METHOD OF REGULATING HORMONE FUNCTION OR RELEASE

P. Michael Conn, Durham, N.C., assignor to Duke University, N.C.

Filed Apr. 12, 1982, Ser. No. 367,339

Int. Cl.[4] A61K *37/00;* **A23J** *7/00;* **C07K** *1/00;* **G01N** *53/00*

U.S. Cl. 514—6 **26 Claims**



1. A synthetic gonadotropin releasing hormone conjugate, which functions as a gonadotropin releasing hormone agonist and consists of

(a) gonadotropin releasing hormone or a biologically active analog thereof which comprises a D-lysine at the 6 position of gonadotropin releasing hormone to which another said gonadotropin releasing hormone or gonadotropin releasing hormone analog is covalently bound via a covalent spacer, wherein said spacer comprises a C_1 to C_{20} hydrocarbon chain and said spacer is from 10–300 Å in length, thereby producing a dimer, and

(b) wherein said dimer is bound via a gonadotropin releasing hormone antibody to another of said dimer to produce said conjugate having gonadotropin releasing hormone agonistic activity.

4,618,599

SYNERGISTINE DERIVATIVES HAVING ANTI-BACTERIAL ACTIVITY AND THEIR USE

Jean-Pierre Corbet, Ecully; Claude Cotrel, Paris; Daniel Farge, Thiais, and Jean-Marc Paris, Vaires sur Marne, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

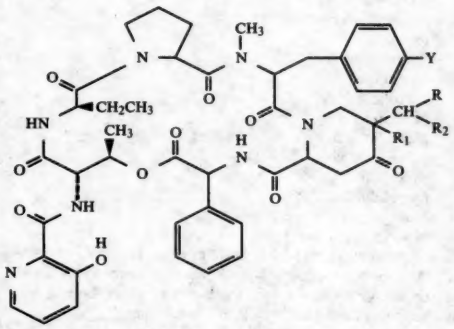
Filed Jul. 12, 1984, Ser. No. 630,288

Claims priority, application France, Jul. 13, 1983, 83 11705

Int. Cl.[4] A61K *37/02;* **C07K** *5/12*

U.S. Cl. 514—11 **12 Claims**

1. A synergistine of the formula:



in which Y represents hydrogen or dimethylamino and

(a) R_1 and R_2 each represent hydrogen, and R represents a member of the class consisting of pyrrolidin-3-ylthio, alkyl-substituted pyrrolidin-3-ylthio, piperidin-3-ylthio, alkyl-substituted piperidin-3-ylthio, piperidin-4-ylthio, and alkyl-substituted piperidin-4-ylthio, and alkylthio substituted by one to two radicals selected from the class consisting of:
hydroxysulphonyl,
alkylamino,
mercaptoalkylamino,
dialkylaminoalkylamino,
dialkylamino,
N-alkyl-N-mercaptoalkyl-amino,
N-alkyl-N-dialkylaminoalkyl-amino
piperazino,
alkyl-piperazino,
mercaptoalkyl-piperazino,
morpholino,
thiomorpholino,
piperidino,
pyrrolidin-1-yl,
piperidin-2-yl,
N-alkyl-piperidin-2-yl,
piperidin-3-yl,
N-alkyl-piperidin-3-yl,
piperidin-4-yl,
N-alkyl-piperidin-4-yl,
pyrrolidin-2-yl,
N-alkylpyrrolidin-2-yl,
pyrrolidin-3-yl, and
N-alkyl-pyrrolidin-3-yl; or

(b) R_1 and R_2 together form a valence bond, and R represents a member of the class consisting of: pyrrolidin-3-ylamino, N-alkyl-pyrrolidin-3-ylamino, piperidin-3-ylamino, N-alkyl-piperidin-3-ylamino, piperidin-4-ylamino, N-alkyl-piperidin-4-ylamino, pyrrolidin-3-yloxy, N-alkyl-pyrrolidin-3-yloxy, piperidin-3-yloxy, N-alkyl-piperidin-3-yloxy, piperidin-4-yloxy N-alkyl-piperidin-4-yloxy pyrrolidin-3-ylthio, N-alkyl-pyrrolidin-3-ylthio piperidin-3-ylthio, N-alkyl-piperidin-3-ylthio piperidin-4-ylthio N-alkyl-piperidin-4-ylthio, and alkylamino, alk-

oxy and alkylthio radicals substituted by one to two radicals selected from the class consisting of:
hydroxysulphonyl
alkylamino
dialkylaminoalkylamino
dialkylamino
N-alkyl-N-dialkylaminoalkyl-amino
trialkylammonio
imidazol-4-yl
imidazol-5-yl
piperazino
alkylpiperazino
mercaptoalkylpiperazino
morpholino
thiomorpholino
piperidino
pyrrolidin-1-yl
piperidin-2-yl
piperidin-3-yl
piperidin-4-yl
pyrrolidin-2-yl
pyrrolidin-3-yl
N-alkyl-pyrrolidin-2-yl, and
N-alkyl-pyrrolidin-3-yl

the aforesaid alkyls and alkyl portions of said radicals containing 1 to 5 carbon atoms each in a linear or branched chain, and its isomeric forms where such exist, and mixtures thereof, and its pharmaceutically acceptable acid addition salts.

4,618,600

NOVEL POLYPEPTIDE DIURETIC/VASODILATORS

Lorin K. Johnson, Castro Valley, Calif.; Steven A. Atlas, and John H. Laragh, both of New York, N.Y., assignors to Biotechnology Research Associates, J.V., Mountain View, Calif.

Filed Apr. 19, 1984, Ser. No. 602,117
Int. Cl.[4] A61K *37/02, 39/00;* **C07K** *7/10*
U.S. Cl. 514—12 **10 Claims**

1. A polypeptide compound useful as a natriuretic, diuretic and vasorelaxant in mammals, said polypeptide compound comprising the formula:

H-Arg-Ser-Ser-Cys-Phe-Gly-Gly-Arg-Ile-Asp-Arg-Ile-Gly-Ala-Gln-Ser-Gly-Leu-Gly-Cys-Asn-Ser-Phe-Arg-X

where X is OH or Tyr-OH; and including such compound containing a disulfide bridge joining the cysteine residues, and the pharmacologically acceptable salts thereof.

4,618,601

MEDICAMENTS BASED ON ZINC GLUCONATE USEFUL FOR THE TREATMENT OF HYPERPROLACTINAEMIAS

Guy Chazot, La Mulatiere, and Catherine Suck, Sceaux, both of France, assignors to 501 Societe Civile de Recherches et d'Etudes Theraputiques, Antony, France

Filed Dec. 3, 1985, Ser. No. 804,099
Claims priority, application France, Dec. 7, 1984, 84 18756
Int. Cl.[4] A61K *31/70, 31/315*
U.S. Cl. 514—23 **2 Claims**

1. A method of treating hyperprolactinaemias which comprises orally administering to a patient in need thereof from 50 to 150 mg of zinc gluconate.

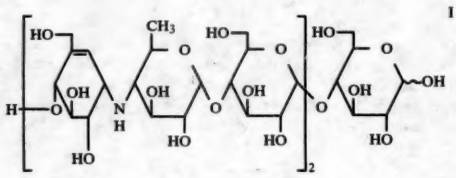
4,618,602

AMINE CONTAINING PSEUDOOLIGOSACCHARIDE, PHARMACEUTICAL COMPOSITION AND METHOD OF USE

László Vértesy, Eppstein; Rudolf Bender, Kronberg, and Hans-Wolfram Fehlhaber, Idstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 3, 1985, Ser. No. 771,638
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1984, 3432432
Int. Cl.[4] A61K *31/73;* **C08B** *37/00*
U.S. Cl. 514—54 **5 Claims**

1. The pseudooligosaccharide of the formula I



I

and a physiologically acceptable salt thereof with an acid.

4. A method which comprises using a compound as claimed in claim 1 for the treatment of diabetes, prediabetes and adiposity.

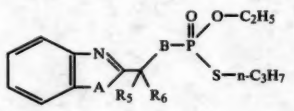
4,618,603

ALPHA-HETEROCYCLIC CARBINOL PHOSPHATES

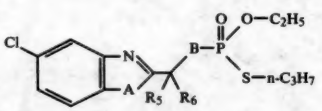
Jamin Huang, Chapel Hill, N.C., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 364,073, Mar. 31, 1982, abandoned. This application Sep. 24, 1985, Ser. No. 779,634
Int. Cl.[4] A01N *57/16, 57/32;* **C07D** *263/56, 263/14*
U.S. Cl. 514—80 **21 Claims**

1. A compound having the formula selected from



and



wherein:
A is O or S;
R_5 is hydrogen;
R_6 is alkyl; and
B is O or S.

15. A method of controlling insects and mites which comprises subjecting them to an insecticidally or miticidally effective amount of the compound of claim 1.

4,618,604

COMPOSITION AND METHOD FOR IMPROVING FEED UTILIZATION OR TISSUE PRODUCTION IN ANIMALS

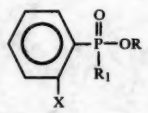
Melvin J. DeGeeter, Chesterfield; Gregory M. Lanza, Kirkwood, and Billy D. Vineyard, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 535,498, Sep. 26, 1983, abandoned. This application Jun. 14, 1984, Ser. No. 620,412

Int. Cl.[4] A61K *31/36, 31/66*

U.S. Cl. 514—130 13 Claims

1. A method of improving feed utilization or tissue production in animals which comprises administering to animals a feed supplement comprising an effective amount of at least one substituted phenylphosphinic acid derivative represented by the structure:



where R is selected from the group consisting of hydrogen, alkyl, aryl and suitable cationic radicals forming pharmaceutically acceptable salts thereof; R_1 is lower n-alkyl; and X is selected from the group consisting of hydroxy, halo, amino, carboxy, nitro, lower n-alkoxy and lower n-alkylamino radicals.

4,618,605

PROCESS FOR THE PRODUCTION OF β-ELEMONIC ACID AND PHARMACEUTICAL PREPARATIONS CONTAINING SAID ACID

Günter Stapel, Münstereifeler St. 30, 5000 Köln 41; Karl-Heinz Gober, Archimedesstr. 38, 5000 Köln 80; Sigurd Leyck, Am Quechenhauf 21, 5024 Pulheim 2; Helmut Wetzig, Paulstr. 46, 5024 Pulheim-Sinnersdorf; Christian Birkner, Grubenbecherstr., 5000 Köln 30; Kurt Kesselring, Villenweg 49, 5024 Erfstadt-Köttingen; Bruno Christ, Peter Franzen-Str. 44, 5000 Köln 3; Klaus Steiner, Gartenstr. 18, 5024 Pulheim-Stommeln, and Friedhelm Schröder, An der Maar 10, 5024 Pulheim 2, all of Fed. Rep. of Germany

Filed Oct. 15, 1984, Ser. No. 660,957

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337229

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—177 4 Claims

1. A process for the production of β-elemonic acid from an alcoholic solution of gum elemi which comprises recovering a crude mixture of elemi acids consisting essentially of β-elemonic acid, $\Delta^7\alpha$-elemolic acid and $\Delta^8\alpha$-elemolic acid, isomerizing the $\Delta^7\alpha$-elemolic acid to $\Delta^8\alpha$-elemonic acid in a chlorinated hydrocarbon in the presence of a mineral acid, oxidizing the $\Delta^8\alpha$-elemolic of the crude acid mixture to yield additional β-elemonic acid, and separating the total resulting β-elemonic acid from said crude acid mixture.

3. A process which comprises administering to a human or animal suffering from inflammatory conditions an effective amount of a preparation containing β-elemonic acid combined with a pharmaceutically acceptable carrier.

4,618,606

ANTIBIOTIC 7-(THIAZOLYL)-3-(PYRAZINYLMETHYL) OR (PYRIDAZINYLMETHYL) CEPHALOSPORINS

Hiroshi Sadaki; Hiroyuki Imaizumi; Takashi Nagai; Kenji Takeda; Isao Myokan, all of Toyama; Takihiro Inaba, Namerikawa; Yasuo Watanabe, Toyama; Yoshikazu Fukuoka, Toyama; Shinzaburo Minami, Toyama, and Isamu Saikawa, Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

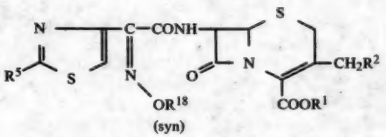
Filed Nov. 16, 1983, Ser. No. 552,468

Claims priority, application Japan, Nov. 17, 1982, 57-200382; Apr. 19, 1983, 58-67871

Int. Cl.[4] A61K *31/545;* C07D *501/46*

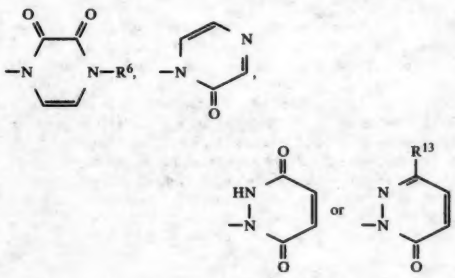
U.S. Cl. 514—202 16 Claims

1. A cephalosporin compound represented by the following formula, or a salt thereof:



(syn)

wherein R^1 represents a hydrogen atom or a carboxyl-protecting group; R^2 represents a group of the formula:



in which R^6 represents a hydrogen atom, a C_{1-5} alkyl group or a di—C_{1-5} alkylamino group and R^{13} represents a C_{1-5} alkyl group; R^5 represents a protected or unprotected amino group; and R^{18} represents a C_{1-5} alkyl group which may be substituted by carboxyl group.

4,618,607

1,4-DIHYDROPYRIDINE-3,5-DICARBOXYLIC ACID ESTER DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS

Kazuhiko Araki; Hideki Ao, both of Nakatsu; Jun Inui, Tokyo, and Kenichi Aihara, Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

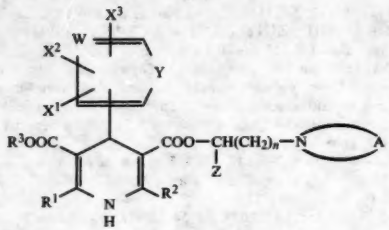
Filed Dec. 10, 1982, Ser. No. 448,576

Claims priority, application PCT Int'l Appl., Mar. 17, 1982, PCT/JP82/00075

Int. Cl.[4] A61K *31/445, 31/55;* C07D *401/12, 401/14*

U.S. Cl. 514—212 7 Claims

1. A 1,4-dihydropyridine-3,5-dicarboxylic acid ester derivative of the general formula:



or a pharmaceutically acceptable acid addition salt thereof, wherein W is —CH═; Y is —CH═CH—, —O—, —S—, —CH═N or —N(R)— (R is hydrogen or lower alkyl); X^1, X^2 and X^3 are the same or different, and are each hydrogen, halogen, nitro, trifluoromethyl, cyano or lower alkylthio; Z is aryl or 5- or 6-membered aromatic heterocyclic ring (which may have a substituent or two or three substituents which are the same or different, and the substituent may be halogen, lower alkyl, lower alkoxy, lower alkanoylamino, cyano, nitro, lower alkylthio, trifluoromethyl, sulfamoyl, di-lower alkyl-sulfamoyl, amino or di-lower alkylamino);

is 5- to 7-membered heterocyclic ring which may have nitrogen atom, oxygen atom, or sulfur atom on the ring and may be substituted by lower alkyl, lower alkoxycarbonyl, lower alkanoylamino, ethylenedioxy or $-(CH_2)_m-OR^4$ (R^4 is hydrogen, lower alkyl or lower alkanoyl and m is 0, 1 or 2); R^1 and R^2 are the same or different and are each lower alkyl; R^3 is lower alkyl, aralkyl or heteroalkyl; and n is an integer 1 to 5.

7. A pharmaceutical composition comprising the compound of claim 1 in combination with a pharmaceutically acceptable inert carrier, said compound being present in a therapeutically effective amount.

4,618,608

OXADIAZINES AND PESTICIDAL COMPOSITIONS CONTAINING THEM

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, and Jozef Drabek, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

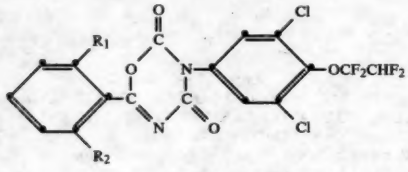
Filed Oct. 21, 1985, Ser. No. 789,677

Claims priority, application Switzerland, Oct. 31, 1984, 5208/84

Int. Cl.[4] C07D *273/04;* A01N *43/72*

U.S. Cl. 514—235 **10 Claims**

1. A compound of formula I



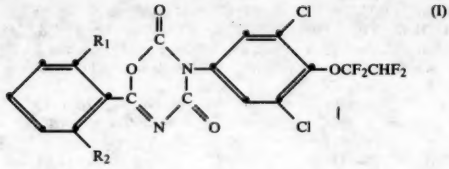
(I)

wherein

R_1 is fluorine or chlorine and

R_2 is hydrogen, fluorine or chlorine.

8. A method of controlling pests of animals and plants, which method comprises applying to said animals and plants or to the locus thereof a pesticidally effective amount of a compound of formula I



(I)

wherein

R_1 is fluorine or chlorine and

R_2 is hydrogen, fluorine or chlorine.

4,618,609

ANTI-ISCHAEMIC AND ANTIHYPERTENSIVE 2-[PYRIMIDYLOXY ALHOXYMETHYL]-1,4-DIHYDROPYRIDINES

David Alker, Eastry; Simon F. Campbell, Deal, and Peter E. Cross, Canterbury, all of England, assignors to Pfizer Inc., New York, N.Y.

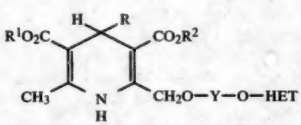
Filed Jun. 5, 1985, Ser. No. 741,339

Claims priority, application United Kingdom, Jun. 7, 1984, 8414520; Apr. 3, 1985, 8508736

Int. Cl.[4] C07D *401/12, 413/14, 401/14;* A61K *31/505*

U.S. Cl. 514—236 **11 Claims**

1. A dihydropyridine compound of the formula



and a pharmaceutically acceptable acid addition salt thereof, wherein R is selected from the group consisting of 2-chlorophenyl and 2,3-dichlorophenyl; R^1 and R^2 are each alkyl having from one to three carbon atoms; Y is selected from the group consisting of $-(CH_2)_2-$ and $-CH_2CH(CH_3)-$; and HET is selected from the group consisting of 2- and 4-pyrimidyl and substituted 2- and 4-pyrimidyl wherein said substituent is selected from the group consisting of carbamoyl, amino, alkoxy having from one to three carbon atoms, chloro, 2-aminoethylamino, 2-hydroxyethylamino, 2-pyridylmethylamino, 2,3-dihydroxypropylamino, 2-pyridylmethoxy, 1-methyl-2-imidazolylmethoxy and morpholino.

10. A pharmaceutical composition comprising an anti-hypertensive or anti-ischaemic effective amount of a compound according to claim 1, together with a pharmaceutically acceptable carrier or diluent.

4,618,610

TRIAZINE DERIVATIVES, AND PHARMACEUTICAL COMPOSITIONS COMPRISING THE SAME

Tsutomu Teraji, Osaka; Youichi Shiokawa, Ibaraki; Kazuo Okumura, Sakai, and Yoshinari Sato, Takaishi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Apr. 23, 1984, Ser. No. 603,173

Claims priority, application Japan, Apr. 22, 1983, 58-72013

Int. Cl.[4] C07D *253/06;* A61K *31/53*

U.S. Cl. 514—242 **12 Claims**

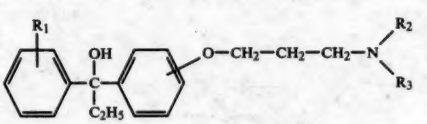
1. The compound, which is 6-(4-cyclopropanecarbonylaminophenyl)-5-methyl-4,5-dihydro-1,2,4-triazin-3(2H)-one.

4,618,611
1-(AMINOALKOXYPHENYL)-1-PHENYL-PROPANOLS, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Edit Tóth; József Törley; György Fekete; László Szporny; László Vereczkey; Éva Pálosi; Imre Klebovich; Pál Vittay; Sándor Görög, and István Hajdu, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt, Budapest, Hungary

Filed Dec. 27, 1983, Ser. No. 565,901
Claims priority, application Hungary, Dec. 28, 1982, 4190/82
Int. Cl.[4] A61K *31/495;* **C07D** *295/02;* **C07C** *149/32*
U.S. Cl. 514—255 **5 Claims**

1. A compound of the Formula (I)



(I)

wherein

R_1 is halogen, trihalomethyl, or alkoxy having 1 to 3 carbon atoms; and

R_2 and R_3 together with the nitrogen atom to which they are attached form a piperazino group which can be substituted in the 4-position by C_1 to C_4 alkyl or benzyl; or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof.

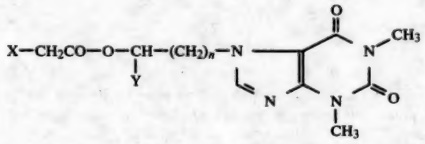
5. A method of treating ethanolic intoxication in an affected animal subject which comprises administering a pharmaceutically effective amount of the compound of the Formula (I) as defined in claim 1 or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof to said subject.

4,618,612
ESTER DERIVATIVES OF 7-(ω-OXYALKYL) THEOPHYLLINE AND THEIR PHARMACEUTICAL ACTIVITY

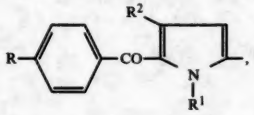
Alessandro Baglioni, Rome, Italy, assignor to Medosan Industrie Biochimiche Riunite S.p.A., Albano Laziale, Italy

Filed Jun. 8, 1984, Ser. No. 618,661
Claims priority, application Italy, Jun. 10, 1983, 48471 A/83
Int. Cl.[4] A61K *31/52;* **C07D** *473/08*
U.S. Cl. 514—265 **15 Claims**

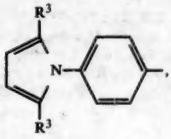
1. Ester derivatives of 7-(ω-oxyalkyl)theophylline of general formula



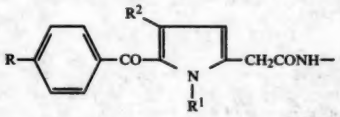
in which X represents an aroylpyrrol radical of formula



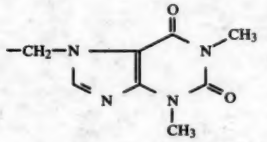
a pyrrylphenyl radical of formula



or an aroylpyrrolacetamide radical of formula



in which R is hydrogen, chloro, methyl or ethyl, R^1 is methyl or ethyl, R^2 is hydrogen or methyl, R^3 is hydrogen or methyl, Y represents hydrogen or the radical



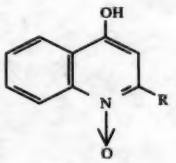
an n represents and integer between 1 and 5.

4,618,613
PREVENTIVE AND HEALING COMPOSITION FOR DISEASES DUE TO LIPOXYGENASE METABOLIC PRODUCTS

Kazuko Hashizume, Tokyo; Hiroshi Kase, Koganei; Shigeto Kitamura, Machida; Takao Iida, Hofu; Kunikatsu Shirahata, Komae; Kenji Omori, Mishima, and Katsuichi Shuto, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 606,997, May 3, 1984, abandoned. This application Jun. 28, 1985, Ser. No. 749,716
Claims priority, application Japan, May 12, 1983, 58-83339
Int. Cl.[4] A61K *31/47*
U.S. Cl. 514—312 **9 Claims**

1. A composition in the form of tablets, pills, powder, granules, capsules or suppositories for treating diseases due to lipoxygenase metabolic products, which comprises an effective lipoxygenase inhibiting amount of a compound represented by the formula:



wherein R is an alkyl group having 1 to 15 carbon atoms and at least one pharmaceutically acceptable carrier.

4,618,614
METHOD OF TREATING PSYCHOSIS USING TETRAHYDROCARBAZOLE DERIVATIVES

Hans-Heinrich Hausberg, Ober-Ramstadt; Henning Böttcher, Darmstadt; Rudolf Gottschlich, Reinheim; Christoph Seyfried, Seeheim-Jugenheim, and Klaus-Otto Minck, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

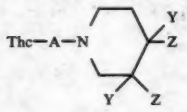
Continuation of Ser. No. 747,594, Jul. 24, 1985, abandoned, which is a division of Ser. No. 568,310, Jan. 4, 1984, Pat. No. 4,547,576. This application Jan. 15, 1986, Ser. No. 818,859

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1983, 3300094; Oct. 8, 1983, 3336643

Int. Cl.[4] A61K *31/44, 31/445*

U.S. Cl. 514—321 **14 Claims**

1. A method of treating psychosis in a patient in need of such treatment comprising administering to the patient a tetrahydrocarbazole derivative of the formula



wherein,

Thc is 1,2,3,4-tetrahydro-3-carbazolyl, 1,2,3,4-tetrahydro-3-carbazolyl substituted once or twice by alkyl, O-alkyl, S-alkyl, SO-alkyl, SO_2-alkyl, OH, F, Cl, Br, CF_3 or CN or by a methylenedioxy group;

the two radicals Y together form a C—C bond;

one radical Z is Ar and the other radical Z is H;

A is $—CH_2—$ or $—CH_2CH_2—$; and

Ar is phenyl, phenyl substituted once or twice by alkyl, O-alkyl, S-alkyl, SO-alkyl, SO_2-alkyl, OH, F, Cl, Br, CF_3 or CN or by a methylenedioxy group, or is 2- or 3-thienyl;

all alkyl groups each have 1–4 C atoms;

or a physiologically acceptable acid addition salt thereof.

4,618,615
CERTAIN 6-PHENOXY-2-PYRIDINYL-α-METHYL-METHYLENE ESTERS OF α-CYCLOPROPYL-α-PHENYL-ACETIC ACID DERIVATIVES AND THEIR USE FOR CONTROLLING PESTS

Peter Ackermann, Pfeffingen; Laurenz Gsell, Basel, and Boris Kohler, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

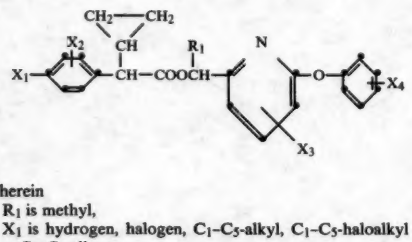
Filed Nov. 7, 1983, Ser. No. 549,149

Claims priority, application Switzerland, Nov. 18, 1982, 6727/82; Sep. 1, 1983, 4816/83

Int. Cl.[4] C07D *213/64, 491/056;* **A01N** *43/40*

U.S. Cl. 514—338 **6 Claims**

1. An α-cyclopropyl-α-phenylacetate or salt thereof, of the formula



wherein

R_1 is methyl,

X_1 is hydrogen, halogen, C_1–C_5-alkyl, C_1–C_5-haloalkyl or C_1–C_5-alkoxy,

X_2 is hydrogen, halogen or C_1–C_5-alkyl, or together with X_1 is methylenedioxy, and

X_3 and X_4 are each hydrogen or halogen.

6. A method of controlling various pests on animals and plants, which method comprises applying thereto or to the locus thereof an effective amount of a compound of claim **1**.

4,618,616
CYCLOPROPYLIDENE ANTIFUNGAL AGENTS

Kenneth Richardson, Canterbury; Robert J. Bass, Birchington, and Kelvin Cooper, Ramsgate, all of England, assignors to Pfizer Inc., New York, N.Y.

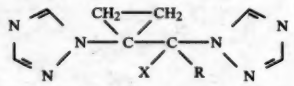
Filed May 24, 1985, Ser. No. 738,143

Claims priority, application United Kingdom, Jun. 7, 1984, 8414519

Int. Cl.[4] A01N *43/653;* **C07D** *249/08*

U.S. Cl. 514—340 **10 Claims**

1. A compound of the formula



(I)

and a pharmaceutically or agriculturally acceptable salt thereof, wherein X is selected from the group consisting of hydroxy and chloro; and R is selected from the group consisting of chlorophenyl, fluorophenyl, dichlorophenyl, difluorophenyl and 5-chloropyrid-2-yl.

7. A pharmaceutical composition comprising a compound according to claim **1** or a pharmaceutically acceptable salt thereof together with a pharmaceutically acceptable diluent or carrier.

8. A fungicidal composition for agricultural use comprising a compound according to claim **1** or an agriculturally acceptable salt thereof together with an agriculturally acceptable diluent or carrier.

4,618,617
NOVEL 5-SUBSTITUTED 1,2,4,-OXADIAZOLE DERIVATIVES AND PREPARATION THEREOF

Michihiro Yamamoto, Nishinomiya, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

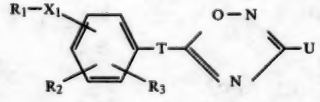
Filed Feb. 24, 1983, Ser. No. 469,511

Claims priority, application Japan, Mar. 3, 1982, 57-34168

Int. Cl.[4] C07D *271/06;* **A01K** *31/41*

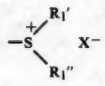
U.S. Cl. 514—364 **18 Claims**

1. A compound of the formula

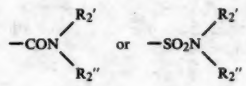


wherein R_1 is phenyl or substituted phenyl; R_2 and R_3 are independently hydrogen or halogen; X_1 is the radical >C=O or —NH— or a single bond; T is lower alkylene; and U is hydrogen, lower alkyl, lower alkenyl, polyhalo-lower alkyl, lower cycloalkyl, lower cycloalkenyl, pyridyl, a group of the formula $R_{12}—T_1—$ (wherein R_{12} is halogen, hydroxy, mercapto, lower alkylsulfinyl, di-lower alkoxymethyl, lower alkoxycarbonyl, carboxy, sulfo, cyano, the group

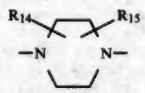
(wherein R′ and R″ may be the same of different, and are hydrogen, lower alkyl or hydroxy-lower alkyl, and when taken together with the adjacent nitrogen atom, they may form a 5- or 6-membered saturated or unsaturated heterocyclic ring, which may contain another nitrogen or oxygen atom, or may form a quaternary ammonium salt or N-oxide) or the group



wherein R_1' and R_1'' may be the same or different, and are lower alkyl or lower alkenyl; and X is a negative monovalent ion; and T_1 is lower alkylene or lower alkenylene, both of which may bear an oxo or a hydroxy group on their carbon chains), or a group of the formula $R_{13}—X_4—T_1—$ (wherein R_{13} is lower alkyl, lower alkenyl, hyroxy-lower alkyl, acyloxy-lower alkyl, amino-lower alkyl, acylamino-lower alkyl, lower cycloalkyl, lower cycloalkenyl, phenyl, substituted phenyl, phenyl-lower alkyl, heterocyclic group, heterocyclic-lower alkyl, acyl, acylthio-lower alkanoyl, mercapto-lower alkanoyl, lower alkoxycarbonyl, lower alkylsulfonyl, the group



(wherein R_2' and R_2'' are independently hydrogen, lower alkyl or hydroxy-lower alkyl); X_4 is the radical —O—, —S—, —NH—,



(wherein R_{14} and R_{15} are independently hydrogen or lower alkyl) or a single bond; and T_1 is as defined above), wherein:

(a) said substituted phenyl is selected from the group consisting essentially of a phenyl group substituted by halogen, trifluromethyl, C_{1-6} alkyl, C_{1-6} alkoxy and C_{1-6} alkanoylamino;

(b) said heterocyclic group is selected from the group consisting essentially of pyridyl, thienyl, furyl, thiazoyl, imidazoyl, pyrazolyl, pyrrolyl, dihydropyrrolyl, pyrrolidinyl, oxazolyl, oxadiazolyl, benzothiazolyl, dihydrobenzothiazolyl, benzoxazolyl, isoindolinyl, idazopyridyl, piperidyl, morphlinyl, pyrimidyl or pyridazinyl, which may optionally be substituted by haogen, C^{16} alkyl, amino, oxo, and phenyl;

(c) said substituted benzoyl is selected from the group consisting esentially of a benzoyl group substituted by halogen, C_{1-6} alkyl, C_{1-3} alkylene-dioxy and C_{1-6} alkylsulfinyl;

(d) said acyl is selected from the group consisting essentially of C_{2-4} alkanoyl, benzoyl, substituted benzoyl as defined in (c) and nicotinoyl;

(e) said substituted styrylidene is selected from the group consisting essentially of a styrylidene group substituted by halogen and C_{1-6} alkylsulfinyl; and wherein

(f) the acyl moieties of acyloxy-lower alkyl, acylamino-lower alkyl and acylthio-lower alkyl in R_{13} as well as acyl therein being as defined in (d); and

(g) the heterocyclic moiety of heterocyclic-lower alkyl in R_{13} being as defined in (b).

4,618,618

COMPOUNDS AND COMPOSITIONS

Errol J. McGarry, 3 Argyll Court, Eltham North, Victoria, Australia (3095)

Continuation of Ser. No. 443,737, Nov. 22, 1982. This application Dec. 28, 1984, Ser. No. 685,617

Claims priority, application Australia, Nov. 25, 1981, PF1691

Int. Cl.[4] C07D *513/04*; A61K *31/425*

U.S. Cl. 514—368 **14 Claims**

1. A compound selected from D,L-2,3,5,6-tetrahydro-6-phenylimidazo[2,1-b]thiazolium 4-cyano-2-iodo-6-nitrophenoxide and L-2,3,5,6-tetrahydro-6-phenylimidazo[2,1-b]thiazolium 4-cyano-2-iodo-6-nitrophenoxide.

4,618,619

SUBSTITUTED T-BUTANOL FUNGICIDAL AGENTS

Erik Regel, Wuppertal; Karl H. Büchel, Burscheid; Paul Reinecke, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

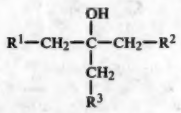
Filed Mar. 14, 1984, Ser. No. 589,613

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311702

Int. Cl.[4] A01N *43/50, 43/64*

U.S. Cl. 514—383 **9 Claims**

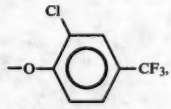
1. A method of combating plant pathogenic fungi comprises administering to such fungi or to a habitat thereof a plant pathogenic fungicidally effective amount of a substituted tert.-butanol derivative of the formula



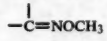
in which

R^1 and R^2 each independently is selected from the group consisting of 1,2,4-triazol-1-yl and 1,2,4-triazol-4-yl, and

R^3 is a member selected from the group consisting of phenoxy; phenoxy substituted up to three times by at least one substituent independently selected from the group consisting of fluorine, chlorine, bromine, methyl, tert.-butyl, methoxy, methylthio, trifluoromethyl, cyclohexyl, nitro, methylcarbonyl, phenyl, chlorophenyl, phenoxy, chlorophenoxy, the radical of the formula



methoximinomethyl, the radical of the formula CH_3



and the —CHO group; phenylthio; and phenylthio substituted up to three times by at least one substituent independently selected from the group consisting of fluorine, chlorine, bromine, methyl, tert.-butyl, 2-methyl-but-2-yl, methoxy, ethoxy, trifluoromethyl and nitro.

4,618,620
FUNGICIDAL COMPOSITION

Yukio Ishiguri; Hirotaka Takano, both of Takarazuka, and Yuji Funaki, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 484,957, Apr. 14, 1983, abandoned. This application Aug. 14, 1985, Ser. No. 765,574
Claims priority, application Japan, Apr. 22, 1982, 57-68097
Int. Cl.[4] A01N *43/52, 43/64*
U.S. Cl. 514—383 2 Claims

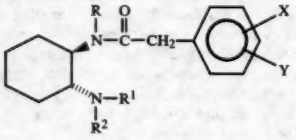
1. A fungicidal composition which comprises an inert carrier and as an active ingredient (E)-1-(2,4-dichlorophenyl)-4,4-dimethyl-2-(1,2,4-triazol-1-yl)-1-penten-3-ol and methylbenzimidazol-2-yl carbamate in the ratio of 1 to 0.5–5 parts by weight in a total amount of 1 to 99% by weight.

4,618,621
METHOD FOR TREATING MEDICAL CONDITIONS INVOLVING CEREBRAL ISCHEMIA

Andrew H. Tang, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 21, 1984, Ser. No. 653,385
Int. Cl.[4] A61K *31/40, 31/165, 31/395*
U.S. Cl. 514—408 4 Claims

1. A process for treating a warm-blooded animal patient suffering from cerebral ischemia which comprises administering to such a patient a safe, non-toxic amount sufficient to prevent or to relieve the consequences of cerebral ischemia of a compound of the formula



(II)

where

R is hydrogen or methyl;

R^1 and R^2, taken separately, are hydrogen, C_1 to C_3-alkyl, or when R^1 is hydrogen or C_1 to C_3-alkyl, R^2 is allyl;

R^1 and R^2, taken together with the nitrogen to which they are bonded, complete a ring selected from the group consisting of azetidinyl and pyrrolidinyl;

X and Y are independently selected from the group consisting of hydrogen, a halogen having an atomic number of from 9 to 35, trifluoromethyl, C_1 to C_3-alkyl, methoxy, azido and phenyl, and at least one of X and Y is a substituent other than hydrogen, and when one of X and Y is azido, phenyl, methoxy or trifluoromethyl, the other of X and Y is hydrogen, and when R is hydrogen, both X and Y are substituents other than hydrogen,

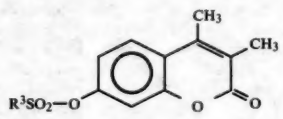
which compounds of Formula II contain the compound having an (S,S) absolute configuration; or a pharmaceutically acceptable salt thereof.

4,618,622
SULFONATES OF HYDROXYCOUMARINS

Rainer Schlecker, Bissersheim; Peter Schmidt, Weisenheim; Peter C. Thieme, Wachenheim; Dieter Lenke, Ludwigshafen; Hans-Jüergen Teschendorf, Dudenhofen; Martin Traut, Heidelberg; Claus D. Mueller, Viernheim; Hans P. Hofmann, Limbergerhof, and Horst Kreiskott, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,787
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1982, 3243158
Int. Cl.[4] C07D *311/08;* A61K *31/37*
U.S. Cl. 514—457 8 Claims

1. A hydroxycoumarin sulfonate of formula I



(I)

wherein R^3 is a straight-chain or branched alkyl radical of 1 to 8 carbon atoms which can be substituted by halogen, or R^3 is an amino group $—NR^4R^5$ or phenyl or naphthyl, each aryl of which is unsubstituted or mono-, di- or tri-substituted by $—NO_2$, halogen, —CN, or a combination of these substituents, wherein R^4 and R^5 are identical or different and each is hydrogen or alkyl of 1 to 4 carbon atoms.

4,618,623
CARBAZIC ACID DERIVATIVES, PROCESS FOR THEIR PREPARATION AND COMPOSITIONS CONTAINING THE SAME

Zoltan Budai; Pal Benko; Ildikó Rátz nee Simonek; Eva Rákóczy nee Pinter; Károly Magyar; József Kelemen, and Attila Mandi, all of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

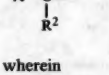
Division of Ser. No. 573,586, Jan. 24, 1984, Pat. No. 4,570,002, which is a continuation-in-part of Ser. No. 491,035, May 3, 1983, abandoned. This application May 23, 1985, Ser. No. 737,388
Claims priority, application Hungary, May 4, 1982, 1381/82
Int. Cl.[4] A61K *31/27*
U.S. Cl. 514—478 9 Claims

1. An animal fodder having a weight gain increasing effect which comprises as active ingredient effective to cause weight gain in an animal in an amount of 1 ppm to 85% by weight a compound of the Formula I

(I)

wherein

R^1 stands for a C_7–C_{12} cycloalkylidene group, an indanylidene group, or a group of the Formula (IX)



(IX)

wherein

A is a phenyl group which can have one or more identical or different substituents selected from the group consisting of halo, nitro, hydroxy, C_1–C_4 alkoxy, C_1–C_4 alkyl, amino, and C_1–C_4 alkoxycarbonyl-hydrazino; or

A is phenyl-(C_1–C_4 alkyl), C_1–C_{16} alkyl, C_3–C_7 cycloalkyl, indolyl, or a C_3–C_6 cycloalkyl group substituted by C_3–C_6 cycloalkyl;

R^2 is hydrogen, C_1–C_6 alkyl, or C_3–C_7 cycloalkyl; and

R^3 is C_1–C_4 alkyl, or a biologically acceptable salt thereof in admixture with an edible solid or liquid carrier or diluent

suitable for use in animal husbandry and with an additive generally used in the production of fodders.

4,618,624

3-AMINO-4-HYDROXY(OR ALKOXY)PHENETHANOLAMINE DERIVATIVES AND PHARMACOLOGICALLY-ACCEPTABLE ACID ADDITION SALTS THEREOF FOR INCREASING THE GROWTH RATE AND/OR IMPROVING THE LEAN MEAT TO FAT RATIO OF WARM-BLOODED ANIMALS

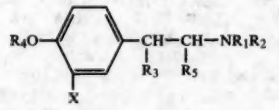
Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 439,495, Nov. 5, 1982, Pat. No. 4,477,680, which is a continuation-in-part of Ser. No. 326,878, Dec. 2, 1981, Pat. No. 4,404,224. This application Jul. 5, 1984, Ser. No. 628,058

Int. Cl.[4] A61K *31/27, 31/22, 31/225, 31/18*

U.S. Cl. 514—486 **5 Claims**

1. A method for increasing the growth rate and the lean meat to fat ratio of warm-blooded animals comprising: administering either orally or parenterally to animals a growth-promoting and lean meat-enhancing amount of a compound having the structural formula,



wherein R_1 is hydrogen or C_1–C_4 alkyl; R_2 is hydrogen, C–C_4 alkyl, C_3–C_5 cycloalkyl, benzyl, phenethyl, α-methylphenethyl or α,α-dimethylphenethyl; R_3 is OH; R_4 is hydrogen, C_1–C_4 alkyl, benzyl or C_2–C_5 alkanoyl; R_5 is hydrogen, methyl or ethyl; X is $N(SO_2R_8)_2$, $N(R_1)_2$, $NHCOR_1$, NH—CO—N—$(R_1)_2$, $NSO_2N(R_1)_2$, $NHCOOR_9$, or NHCOO-benzyl; R_8 is C_1–C_4 alkyl; R_9 is C_1–C_5 alkyl; with the provisos that when R_2 is C_3–C_5 cycloalkyl, benzyl, phenethyl, α-methylphenethyl or α,α-dimethylphenethyl, R_1 of NR_1R_2 is hydrogen; and further that the R_1 group in $(R_1)_2$ may or may not be identical substituents; and the optically active isomers and pharmacologically acceptable acid addition and metal salts thereof.

4,618,625

ZINC CARBOCYSTEINATE

Antonio B. Vinas, Barcelona, Spain, assignor to Laboratorios Vinas, S.A., Barcelona, Spain

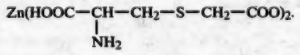
Filed Jul. 31, 1984, Ser. No. 636,201

Claims priority, application Spain, Aug. 8, 1983, 524820

Int. Cl.[4] C07F *3/06*

U.S. Cl. 514—494 **3 Claims**

1. A compound having the formula:



2. A pharmaceutical composition comprising an amount of a compound as claimed in claim 1 effective to treat hair or skin conditions including seborrhea, alopecia, oily hair, exfoliative dermatitis, acne or fingernail fragility, in combination with a pharmacologically acceptable carrier, diluent or vehicle.

4,618,626

NOVEL CARBACYCLIN ESTERS, PROCESS FOR THE PREPARATION THEREOF, AND THEIR USE AS MEDICINAL AGENTS

Werner Skuballa; Bernd Radüechel; Helmut Vorbrueggen, all of Berlin; Gerda Mannesmann, Cologne; Bob Nieuweboer, and Michael-Harold Town, both of Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

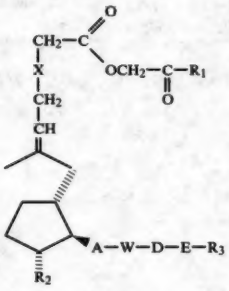
Continuation of Ser. No. 499,687, May 31, 1983, abandoned. This application Sep. 16, 1985, Ser. No. 777,535

Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3221193

Int. Cl.[4] C07C *177/00;* **A61K** *31/557*

U.S. Cl. 514—530 **31 Claims**

1. A carbacyclin of the formula



wherein

R_1 is phenyl, α-naphthyl or β-naphthyl; or phenyl, α-naphthyl or β-naphthyl each substituted by 1–3 C_{1-4}-alkoxy groups, 1–3 halo atoms, 1–3 phenyl groups or 1–3 phenyl groups substituted by 1–3 halo atoms;

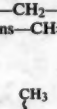
R_2 is OH or OR:

R_3 is (a) C_{2-10}-alkenyl, (b) C_{1-10} alkyl, (c) C_{2-10} -alkenyl or C_{1-10} alkyl each substituted by C_{6-10} aryl or C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, (d) C_{3-10} cycloalkyl, (e) C_{3-10} cycloalkyl substituted by C_{1-4} alkyl, (f) C_{6-10} aryl, (g) C_{6-10} aryl substituted by 1–3 halogen atoms, a phenyl group, 1–3 C_{1-4} alkyl groups or a chloromethyl, fluoromethyl, trifluoromethyl, carboxy, hydroxy or C_{1-4} alkoxy group, or (h) an aromatic heterocycle of 5 or 6 ring atoms one of which is O, N or S, the remainder being carbon atoms;

X is an oxygen atom or $—CH_2—$;

A is $—CH_2—CH_2—$, trans—CH=CH—, or —C≡C—;

W is —CHOR— or



wherein the OR-group can be in the -or -position,

D is

$—CH_2—CH_2—$; $—CH_2—CH_2$1-substituted by CH_3 or di—CH_3 or substituted by 1,2-methylene; or one of the former substituted by fluorine;

n is 0–4;

E is —C≡C, or —CR_4=CR_5—wherein R_4 and R_5 each independently is hydrogen or alkyl or 1–5 carbon atoms, and

R is H, tetrahydropyranyl, tetrahydrofuranyl, α-ethoxyethyl, trimethylsilyl, dimethyl-tert-butysilyl, tribenzylsilyl or an acyl group of a C_{1-15}-hydrocarbon carboxylic or sulfonic acid.

4,618,627

CATECHOL DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS THEREOF FOR INHIBITING ANAPHYLAXIS (SRS-A)

Kiyoshi Murase, Saitama; Toshiyasu Mase, Chiba; Hideki Arima, Tokyo, and Kenichi Tomioka, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

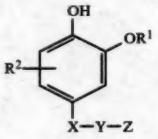
Filed May 11, 1984, Ser. No. 609,143

Claims priority, application Japan, May 13, 1983, 58-83748; Oct. 25, 1983, 58-199854; Dec. 29, 1983, 58-248034; Feb. 24, 1984, 59-34979

Int. Cl.[4] C07C *39/08, 43/164, 47/11*; A61K *31/05*

U.S. Cl. 514—678 **19 Claims**

1. A catechol derivative represented by the formula



wherein R^1 represents a hydrogen atom; R^2 represents a hydrogen atom or a halogen atom; X represents a straight chain or branched alkylene group having 1 to 15 carbon atoms or a vinylene group; Y represents a carbonyl group or a group represented by

(wherein R^3 and R^4, which may be the same or different, each represents a hydrogen atom or a lower alkyl group) and Z represents a hydrogen atom, a straight chain or branched alkyl group having 1 to 15 carbon atoms or a cycloalkyl group; the sum of the carbon atoms of said X and Z being at least 7.

7. A pharmaceutical composition for inhibiting the production and release of slow reacting substance of anaphylaxis (SRS-A) comprising a pharmaceutically effective amount of the compound of claim 1 and a pharmaceutically acceptable carrier.

14. A method of preventing and/or treating disorders of various allergic diseases, ischemic heat diseases or inflamations, caused by slow reacting substance of anaphylaxis (SRS-A) or leukotriens comprising administering a pharmaceutically effective amount of the composition of claim 7.

4,618,628

CATALYTIC PROCESS

Robert A. Head, Chester, and Robin Whyman, Christleton Nr Chester, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 485,455, Apr. 15, 1983, abandoned. This application Dec. 12, 1984, Ser. No. 680,660

Claims priority, application United Kingdom, Apr. 15, 1982, 8211002; Jan. 1, 1983, 8301005

Int. Cl.[4] C07C *27/06*

U.S. Cl. 518—700 **11 Claims**

1. A method for the selective, direct preparation of ethanol which comprises contacting a mixture of carbon monoxide and hydrogen at a temperature of from 100° to 400° C. and at a pressure of from 50 to 1000 bars with a catalyst comprising ruthenium and at least one other metal selected from Groups VII and VIII of the Periodic Table and a source of iodide ions in a liquid medium comprising an aprotic amide or imide or an aprotic heterocyclic compound containing an —OCO— grouping in the ring.

4,618,629

FRAGRANCE-EMITTING POLYURETHANE FOAMS

Michael S. Buchanan, Baltimore, Md., assignor to Wm. T. Burnett & Co., Inc., Baltimore, Md.

Filed May 29, 1985, Ser. No. 739,075

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—76 **18 Claims**

1. A flexible polyurethane foam comprising the foam-forming reaction product of water as a foaming agent, an isocyanate reactive polyol and a polyisocyanate, and including uniformly contained in said foam a fragrance material comprising a finely divided resin carrying a fragrance, said water being present in an amount sufficient to provide a flexible foam and said fragrance material being present in an amount sufficient to provide fragrance-emitting characteristics to said foam for a prolonged time period.

4,618,630

ORGANIC POLYMER COMPOSITION CONTAINING AN ANTISTATIC AGENT COMPRISING A NONVOLATILE IONIZABLE METAL SALT AND A SALT OR ESTER OF A CARBOXYLIC ACID

Thomas M. Knobel; Earl E. Kennedy, and Mary A. Walker, all of Lake Jackson, Tex., assignors to The Dow Chemical Co., Midland, Mich.

Continuation-in-part of Ser. No. 644,586, Aug. 27, 1984, abandoned. This application Jul. 2, 1985, Ser. No. 751,351

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—105 **29 Claims**

1. An organic polymer composition comprising an organic polymer having dispersed therein

(a) a non-volatile ionizable metal salt and

(b) an enhancer compound comprising a salt or ester of a carboxylic acid, which salt or ester contains about 6 to about 30 carbon atoms and is compatible with said organic polymer, and in which said metal salt is soluble, wherein from about 1 to about 25 moles of said enhancer are present per mole of ionizable metal salt.

4,618,631

PRODUCTION PROCESS FOR HIGHLY WATER ABSORBABLE POLYMER

Hisao Takeda, Zama, and Yasunori Taniguchi, Samukawamachi, both of Japan, assignors to American Colloid Company, Skokie, Ill.

Division of Ser. No. 710,702, Mar. 11, 1985, which is a division of Ser. No. 460,037, Jan. 21, 1983, Pat. No. 4,525,527. This application Mar. 4, 1986, Ser. No. 836,103

Claims priority, application Japan, Jan. 25, 1982, 57-8983; Mar. 9, 1982, 57-035913; Mar. 9, 1982, 57-035914

Int. Cl.[4] C08J *9/02*

U.S. Cl. 521—109.1 **3 Claims**

3. A method of manufacturing a composition comprising mixing a monomer solution of (A) acrylic acid, neutralized 70 to 100 mole percent, (B) acrylamide in a mole ratio of (A):(B) in the range of 70:30 to 100:0; (C) a water soluble or water miscible polyvinyl monomer cross-linking agent in an amount of 0.001 to 0.3 percent by weight of (A) plus (B); and water to form a mixed monomer solution, wherein the monomers of the mixed monomer solution consist essentially of (A), (B) and (C) and the monomer concentration is at least 70 percent by weight of the monomer solution prior to polymerization initia-

tion; incorporating a porosity increasing agent into said mixed monomer solution selected from the group consisting of polystyrene and methylcellulose in an amount of 0.5 to 10 percent based on the total weight of monomers in the mixed monomer solution; and initiating polymerization of monomers (A) and (B) such that during polymerization, the exothermic heat of reaction is substantially the only heat energy used to accomplish polymerization, cross-linking and to drive off sufficient water to form a water absorbing cross-linked polyacrylate resin composition having a water content of 15 percent by weight or less, and wherein said neutralized acrylic acid is one other than potassium acrylate.

4,618,632
UV CURABLE HIGH TENSILE STRENGTH RESIN COMPOSITION

Wei-Fang A. Su, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 7, 1985, Ser. No. 699,373
Int. Cl.[4] C08L *67/02*
U.S. Cl. 522—43 **32 Claims**

1. A resin composition containing no non-reactive solvent comprising

(A) a polyester that comprises the reaction product of

(1) polyhydroxy compound having at least three hydroxyl groups, and

(2) aromatic compound that is at least difunctional in a group selected from acid, anhydride, ester, and mixtures thereof, where the proportion of said polyhydroxy compound to said aromatic compound is selected so that said polyester has about 150 to about 250 mole % excess hydroxyl groups;

(B) an acrylate urethane in about stoichiometric proportion with said polyester up to about 10% excess polyester over stoichiometric, where said acrylate urethane comprises the reaction product of

(1) hydroxy acrylate having a single hydroxyl group; and

(2) diisocyanate, said hydroxy acrylate being equimolar ±10 mole % with said diisocyanate; and

(C) liquid acrylate reactive diluent sufficient to give said resin composition a viscosity of less than 5000 cps.

17. A composition according to claim **1** which includes about 1 to about 5 phr of a UV photoinitiator.

4,618,633
HALOGEN-FREE SELF-EXTINGUISHING THERMOPLASTIC MOLDING MATERIAL

Christof Taubitz, Wachenheim; Volker Muench, Ludwigshafen; Juergen Hambrecht, Heidelberg; Adolf Echte, Ludwigshafen, and Karl H. Illers, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 5, 1985, Ser. No. 772,662
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1984, 3432750
Int. Cl.[4] C08K *3/02, 5/51, 5/52, 5/53*
U.S. Cl. 524—80 **5 Claims**

1. A halogen-free self-extinguishing thermoplastic molding material comprising

A: 3–97% by weight of a halogen-free thermoplastic resin which contains as copolymerized units

(a_1) from 60 to 91% by weight, based on A, of one or more vinylaromatic monomers from the group consisting of styrene, α-methylstyrene, p-methylstyrene or mixtures of these, and

(a_2) from 40 to 9% by weight, based on A, of acrylonitrile,

B: from 0 to 40% by weight of an elastomer from the group consisting of polybutadiene, polyacrylates and copolymers of the monomers of these polymers, which has a glass transition temperature below 0° C. and is used in the form of a graft copolymer formed from monomers (a_1) and (a_2) of component A as the grafted shell and one of the above rubbers as a base,

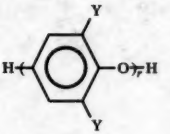
C: 97–3% by weight of a further halogen-free thermoplastic resin which differs from A,

D: 0.5–40% by weight of a phosphorus-containing flameproofing agent and

E: 4–30% by weight of a phenol/aldehyde resin,

the percentages in each case being based on the molding material consisting of A, B, C, D, E and F,

wherein component C is a poly(phenylene) ether of the general formula (I)



(I)

where Y is a monovalent substituent, such as H or a hydrocarbon radical which does not possess a tertiary carbon atom in the α-position and is of 1 to 25 carbon atoms or alkoxy of 1 to 25 carbon atoms, and r is an integer of from 20 to 200, and the molding material furthermore contains

F: 0.3–95% by weight of a copolymer which consists of a main chain and one or more side chains attached to this by condensation, the main chain having a weight average molecular weight $\overline{M}_w$ of from 5,000 to 5 million and the side chain or chains each having a weight average molecular weight of from 2,000 to 80,000, determined by gel permeation chromatography,

the main chain furthermore constitutes a terpolymer which contains, as copolymerized units,

(f_a) 60–91% by weight of one or more vinylaromatic monomers of 8 or 9 carbon atoms,

(f_b) 40–9% by weight of acrylonitrile and

(f_c) 0.3–10% by weight of one or more monomers from the group consisting of the esters of acrylic acid and methacrylic acid which contain alcohol radicals capable of ether formation,

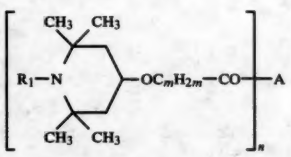
and each side group possesses one or more poly(phenylene) ether radicals which bond the polymer of the side group to the monomer or monomers capable of ether formation, bonding taking place in each case via the radical of a bifunctional or polyfunctional coupling agent.

4,618,634
COMPOUNDS CONTAINING PIPERIDINE GROUPS, AS STABILIZERS FOR SYNTHETIC POLYMERS

Giuseppe Cantatore, Bitonto, and Valerio Borzatta, Bologna, both of Italy, assignors to Ciba-Geigy S.p.A., Origgio, Italy

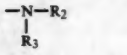
Filed Feb. 27, 1985, Ser. No. 706,301
Claims priority, application Italy, Feb. 28, 1984, 19830 A/84
Int. Cl.[4] C07D *401/12, 401/14;* C08K *5/34, 5/35*
U.S. Cl. 524—97 **14 Claims**

1. A compound of the formula

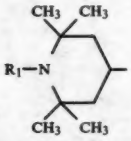


(I)

in which R_1 is hydrogen, O—, cyanomethyl, C_1–C_{12}-alkyl, C_3–C_{12}-alkenyl or -alkylnyl, C_7–C_{12}-aralkyl or C_1–C_{12}-acyl, m is an integer from 1 to 12 and n is an integer from 1 to 3, and, if n=1, A is a radical

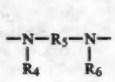


in which R_2 and R_3 can be identical or different and are hydrogen, C_1–C_{18}-alkyl, C_1–C_{18}-alkyl substituted by C_1–C_{18}-alkoxy or C_2–C_{18}-dialkylamino, C_3–C_{18}-alkenyl, C_5–C_{18}-cycloalkyl, C_6–C_{18}-aryl, C_7–C_{18}-aralkyl or a radical of the formula (II)

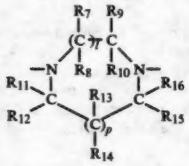


(II)

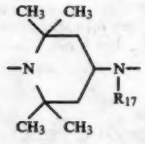
in which R_1 is as defined above, or A is a monovalent radical of a 5-membered to 13-membered heterocyclic compound containing at least one nitrogen atom, the free valency being on the nitrogen atom, and, with n=2, A is a radical of the formula (III), (IV) or (V)



(III)

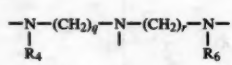


(IV)



(V)

in which R_4, R_6 and R_{17} can be identical or different and are as defined for R_2 and R_3, R_5 is C_2–C_{18}-alkylene, C_4–C_{18}-alkylene substituted by 1 to 3 oxygen atoms, C_5–C_{12}-cycloalkylene, C_6–C_{12}-arylene or C_7–C_{12}-aralkylene, the radicals R_7–R_{16} can be identical or different and are hydrogen or methyl, R_9 together with R_{10} and R_{13} together with R_{14} can be oxygen, p and l indipendently are zero or 1, and, with n=3, A is a radical of the formula (VI)



(VI)

in which R_4 and R_6 are as defined above and q and r can be identical or different and are integers from 2 to 6, or A is a hexahydro-1,3,5-triazine-1,3,5-triyl radical.

9. A light-stabilised, heat-stabilised and oxidation-stabilised polymer composition comprising a synthetic polymer and one or more stabilisers of the formula (I) in a quantity from 0.01 to 5% by weight relative to the weight of the synthetic polymer.

4,618,635

COATING COMPOSITIONS PREPARED FROM LACTONE-ACRYLATE ADDUCT, POLYOL AND ISOCYANATE

Claiborn L. Osborn; Joseph V. Koleske, and Kenneth Drake, all of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 509,389, Jun. 30, 1983, abandoned. This application May 17, 1985, Ser. No. 735,096

Int. Cl.[4] C08L *75/00*

U.S. Cl. 524—113 **28 Claims**

1. A composition suitable for use as a radiation curable coating comprising the reaction product of a polycaprolactone polyol, a multi-functional isocyanate, and a lactone-acrylate adduct.

4,618,636

FLAMEPROOFED THERMOPLASTIC MOLDING MATERIAL COMPRISING A NOVOLAK RESIN

Volker Muench, Ludwigshafen; Juergen Hambrecht, Heidelberg; Herbert Naarmann, Wattenheim; Adolf Echte, Ludwigshafen, and Karl H. Illers, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 18, 1985, Ser. No. 692,621

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1984, 3401834

Int. Cl.[4] C08K *3/10, 5/51, 5/13;* **C08L** *61/10*

U.S. Cl. 524—176 **16 Claims**

1. A flameproofed thermoplastic molding material, comprising

A. one or more thermoplastic resins containing a vinyl-aromatic monomer,

and furthermore contains

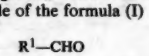
B. from 0 to 100 parts by weight of one or more elastomers having a glass transition temperature Tg<0° C., as an impact modifier,

C. from 2 to 50 parts by weight of one or more halogen-containing organic compounds (flameproofing agents),

D. from 0.5 to 20 parts by weight of a member selected from the group consisting of As_2O_3, Sb_2O_3, Bi_2O_3, SnO_2, Fe_2O_3, ferrocene, Al_2O_3, ZnO, hypophosphites, borates and mixtures thereof (synergistic agents with component C) and

E. from 5 to 50 parts by weight of a novolak (phenol/aldehyde resin),

the amounts in each case being based on 100 parts by weight of A, wherein the novolak used has a number average molecular weight $\bar{M}_n$ of from 500 to 2000 and is obtainable from an aldehyde of the formula (I)



(I)

where R^1 is H, C_1–C_{10}-alkyl, cycloalkyl, C_6–C_{12}-aryl or ω-aryl-C_1–C_3-alkyl, and a mixture of phenols, and this mixture contains two or more monosubstituted phenols and the substituents can be alkyl of 1 to 8 carbon atoms or CN.

4,618,637

POLYMER MIXTURE WHICH COMPRISES A POLYPHENYLENE ETHER AND A DIHYDRAZIDE AS A STABILIZER

Johannes H. G. M. Lohmeijer, Hoogerheide; Jacobus W. M. Noordermeer, Nieuwstadt/Susteren, and Jan Bussink, Bergen op Zoom, all of Netherlands, assignors to General Electric Company, Selkirk, N.Y.

Filed Dec. 16, 1985, Ser. No. 809,553

Claims priority, application Netherlands, Dec. 20, 1984, 8403863

Int. Cl.[4] C08K *5/25*

U.S. Cl. 524—192 **4 Claims**

1. A polymer mixture which comprises a polyphenylene ether and a dihydrazide as an antioxidant stabilizer, character-

ized in that per 100 parts by weight of polyphenylene ether the polymer mixture comprises 0.05–5 parts by weight of oxalyldihydrazide as the stabilizer.

4,618,638

COMPOSITIONS CONTAINING ALPHA-CYANOCINNAMATE ULTRAVIOLET-ABSORBING STABILIZERS SUBSTITUTED BY AN ALIPHATIC HYDROXYL GROUP

Martin Dexter, Briarcliff Manor, and Roland A. E. Winter, Armonk, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 431,497, Sep. 30, 1982, Pat. No. 4,504,419, which is a division of Ser. No. 318,648, Nov. 5, 1981, Pat. No. 4,414,393. This application Nov. 23, 1984, Ser. No. 674,216

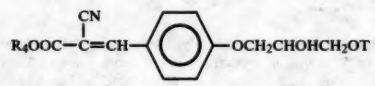
Int. Cl.[4] C08K *5/34*

U.S. Cl. 524—208 **4 Claims**

1. A stablized composition which comprises

(a) a polymer, and

(b) 0.1 to 5% by weight of said polymer of a compound having the formula



where T is alkyl of 4 to 14 carbon atoms, and R_4 is alkyl of 1 to 4 carbon atoms.

4,618,639

ANTISTATIC ORGANOPOLYSILOXANE COMPOSITION

Masaharu Takahashi, and Motoo Fukushima, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1985, Ser. No. 755,424

Claims priority, application Japan, Jul. 19, 1984, 59-150278

Int. Cl.[4] C08K *5/24*

U.S. Cl. 524—262 **1 Claim**

1. An antistatic organopolysiloxane composition which comprises

(a) 100 parts by weight of an organopolysiloxane gum represented by the average unit formula

$$R_aSiO_{(4-a)/2},$$

in which R is a monovalent hydrocarbon group and the subscript a is a positive number in the range from 1.98 to 2.01;

(b) up to 500 parts by weight of a siliceous filler;

(c) from 2.5 to 25 parts by weight of an organopolysiloxane represented by the average unit formula

$$R_c[NC—C_3H_6]_fSiO_{(4-e-f)/2},$$

in which e is zero or a positive number not exceeding 2, c is zero, 1 or 2, and f is a positive number from 0.01 to 2 with the proviso that e+f is in the range from 0.01 to 2.01 and the weight percentage of the cyano groups is from 0.05 to 20%, component (c) having a viscosity of at least 10 centistokes at 25° C.; and

(d) and organic peroxide.

4,618,640

HOT-MELT ADHESIVE COMPOSITIONS COMPRISING A PARTIALLY (FUMARIZED AND/OR MALEINIZED) DISPROPORTIONATED ROSIN ESTER TACKIFIER

Seiichi Tsuchida, Sakai; Yoshihiro Kodama, Kobe, and Hiroari Hara, Osaka, all of Japan, assignors to Arakawa Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP84/00351, § 371 Date Mar. 20, 1985, § 102(e) Date Mar. 20, 1985, PCT Pub. No. WO85/00615, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 9, 1984, Ser. No. 717,175

Claims priority, application Japan, Jul. 27, 1983, 58-138526

Int. Cl.[4] C09J *3/14, 3/26;* **C08L** *23/08, 93/04*

U.S. Cl. 524—272 **14 Claims**

1. A hot melt adhesive composition containing an ethylene copolymer, wax and a tackifying resin as major components, the composition being characterized in that the tackifying resin is partially fumarinized and/or partially maleinized, disproportionated rosin ester.

4,618,641

CONCENTRATED, AQUEOUS DISPERSIONS OF VINYLIDENE FLUORIDE POLYMERS AND A PROCESS FOR THEIR PREPARATION

Rolf Hengel, Burgkirchen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 7, 1985, Ser. No. 785,160

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437278

Int. Cl.[4] C08K *5/09*

U.S. Cl. 524—284 **11 Claims**

1. An improved concentrated, aqueous, colloidal dispersion of at least one copolymer of vinylidene fluoride containing at least 5% strength by weight of vinylidene fluoride and at least one further fluoroolefinic comonomer, having a solids content of 30 to 65% by weight, based on the total weight of the concentrated dispersion, wherein the improvement comprises having a content of 2 to 8% strength by weight, based on the solids content of the concentrated dispersion, of at least one ammonium salt of a carboxylic acid, which has 10 to 14 carbon atoms and is unsubstituted by fluorine or chlorine, as dispersion stabilizer.

4,618,642

SILICONE WATER-BASED CAULKING MATERIAL

Christine J. Schoenherr, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 2, 1985, Ser. No. 729,835

Int. Cl.[4] C08G *77/16;* **C08K** *3/26, 3/22;* **C08L** *83/08*

U.S. Cl. 524—425 **12 Claims**

1. A silicone composition consisting essentially of the aqueous emulsion obtained by mixing

(A) 100 parts by weight of an anionically stabilized, hydroxyl endblocked polydiorganosiloxane having a weight average molecular weight of above 50,000, the organic radicals being monovalent hydrocarbon radicals containing less than 7 carbon atoms per radical or 2-(perfluoroalkyl)ethyl radicals having less than 7 carbon atoms per radical, present as an emulsion of dispersed particles in water, the emulsion having a pH of greater than 9 and a solids content of greater than 50% by weight,

(B) from 0.075 to 0.75 part by weight of dialkyltindicarboxylate,

(C) from 0.2 to 5 parts by weight of silane of the formula $RSi(OR')_3$ where R is a monovalent hydrocarbon radical of from 1 to 4 carbon atoms inclusive and R' is a lower alkyl radical of from 1 to 4 carbon atoms inclusive or a radical of the formula $—N=CR_2$ where R is as defined above and,

(D) from 50 to 200 parts by weight of inert, non-siliceous filler, to produce a paste-type emulsion having a total solids content of greater than 70% by weight and being

useful as caulking material that cures upon removal of the water to an elastomer.

2. The composition of claim 1 in which the polydiorganosiloxane is a polydimethylsiloxane having a weight average molecular weight in the range of from 200,000 to 700,000.

6. The composition of claim 2 in which the dialkyltindicarboxylate is dioctyltindilaurate or dibutyltindilaurate in an amount of from 0.2 to 0.4 part by weight, the silane is methyltrimethoxysilane or vinyltrimethoxysilane in an amount of from 0.4 to 2 parts by weight, and the filler is calcium carbonate having an average particle size of less than 2 micrometers.

4,618,643

GLUE STICK ADHESIVES

Hubertus von Voithenberg, and Gotz Hillert, both of Bad Homburg, Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

Filed Mar. 2, 1984, Ser. No. 585,520

Claims priority, application United Kingdom, Mar. 2, 1983, 8305733

Int. Cl.[4] C08L *67/02, 67/04;* C08G *63/08, 63/18*

U.S. Cl. 524—430 **10 Claims**

1. A hot melt glue stick suitable for use in conjuction with a device for melting and dispensing a glue stick, the glue stick comprising thermoplastic copolyester material corresponding to a condensation product of:

(a) an acid component consisting essentially of

44 to 53 moles % of terephthalic acid,

33 to 48 moles % of isophthalic acid, and

10 to 15 moles % of aliphatic dicarboxylic acid having 4 to 12 carbon atoms in its molecular chain

and

(b) a hydroxyl component comprising one or more aliphatic diols of which not less than 90 moles % of the aliphatic diols is 1.4 butance diol, and

(c) a polymeric hydroxyl bearing diol polyester component present to an extent of about 1 to about 10 wt % of the components (a) and (b) provided that when the hydroxyl componet (b) consists solely of 1.4 butane diol, the polyester is present to an extent of not less than 3% weight of the components (a) and (b), the glue stick having a melting point (DSC) in the range 90 to 120° C., and a reduced viscosity (measured in a mixture of phenol and tetrachloroethane in a ratio by weight of 60 to 40 using 0.4 g copolyester per 100 ml mixture) of 0.5 to 0.7.

8. A hot melt glue stick suitable for use in conjuction with a device for melting and dispensing a glue stick, the glue stick comprising thermoplastic copolyester material corresponding to a condensation product of an acid component comprising

about 46 moles % terephthalic acid,

about 41 mo'es % esophthalic acid, and

about 13 moles % aliphatic dicarboxylic acid

having 4 to 12 carbon atoms in its molecular chain, and a hydroxyl component comprising 1.4 butane diol and a second aliphatic diol in a molar ratio of about 95:5, and a polymeric hydroxyl bearing diol polyester in an amount sufficient to provide about 3 to 4% by weight of the copolyester,

the glue stick having a melting point (DSC) in the range 105° to 110° and a reduced viscosity (measured in a mixture of phenol and tetrachloroethane in a ratio by weight of 60 to 40 using 0.4 gm copolyester per 100 ml mixture) of 0.6 to 0.65.

4,618,644

NOVEL SILICONE-CONTAINING INTERPENETRATING POLYMER NETWORKS

Wan-Li Liu, Ballston Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Apr. 16, 1985, Ser. No. 724,361

The portion of the term of this patent subsequent to Apr. 29, 2003, has been disclaimed.

Int. Cl.[4] C08F *283/12;* C08L *83/10*

U.S. Cl. 524—535 **12 Claims**

1. A curable composition comprising:

(I) a silicone resin comprising:

(a) at least one block consisting essentially of from about 6 to about 120 units of the formula

$$R^2SiO$$

(b) at least one block consisting essentially of from about 3 to about 160 units of the formula

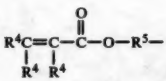
$$R^1SiO_{1.5},$$

and

(c) at least one block consisting essentially of from about 0.1 to about 20 mole percent of (a) and (b) of units of the formula

$$RR^3SiO;$$

where R is an independently selected alkyl radical having 1 to 5 carbon atoms, aryl radical having 6 to 10 carbon atoms, or aralkyl radical having 6 to 10 carbon atoms; R^1 is an aryl or aralkyl radical having 6 to 10 carbon atoms; and R^3 is an acrylic-functional radical having the general formula



where the R^4 radicals are the same or different and represent hydrogen parts or monovalent substituted or unsubstituted hydrocarbon radicals having from 1 to 12 carbon atoms and R^5 is a divalent substituted or unsubstituted hydrocarbon radical having from 2 to 12 carbon atoms, said resin being dispersed in

(II) at least one olefinic monomer.

4,618,645

METHOD OF PRODUCING AQUEOUS LATEX OF CROSSLINKED POLYDIORGANOSILOXANE

Therese M. Bauman, and David J. Huebner, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 24, 1985, Ser. No. 737,600

Int. Cl.[4] C08K *5/41, 5/42;* C08L *83/14*

U.S. Cl. 524—745 **15 Claims**

1. A method of producing an aqueous latex of crosslinked polydiorganosiloxane consisting essentially of

(A) homogenizing immediately after admixing, a mixture consisting essentially of

(1) 100 parts by weight of polydiorganosiloxane of the formula

$$HO(R_2SiO)_xH$$

wherein each R is a radical selected from the group consisting of methyl, ethyl, propyl, phenyl, vinyl, allyl, and 3,3,3-trifluoropropyl, and x is an average value in the range of from 3 to 100 inclusive,

(2) from 0.5 to 15 parts by weight of alkoxy silicon com-

pound selected from the group consisting of silane of the formula

$$R_a'Si(OR^3)_{4-a}$$

wherein R′ is a monovalent hydrocarbon radical having up to 12 carbon atoms, R^3 is an alkyl radical having from 1 to 6 inclusive carbon atoms, and a is 0 or 1; a partial hydrolyzate of the silane where the partial hydrolyzate is soluble in the polydiorganosiloxane (1); and mixture of silane and partial hydrolyzate,

(3) sufficient anionic emulsifying agent to give an emulsion particle of an average diameter of from 0.3 to 0.4 micrometers, wherein said emulsifying agent is an alkali metal surface active sulfonate or sulfate, and

(4) water, to give a non-volatile content of from 50 to 80 percent by weight, then

(B) admixing into the emulsion (A) from 15 to 100 millimoles of surface active anionic catalyst per kilogram of polydiorganosiloxane, wherein said catalyst is a surface active sulfonic acid catalyst or a surface active hydrogen sulfate catalyst, then

(C) maintaining the catalyzed emulsion at a temperature of from 15° to 30° C. for at least 5 hours at a pH of less than 5 until the desired molecular weight of polydiorganosiloxane is obtained, then

(D) admixing sufficient base to raise the pH of the emulsion to greater than 7, to give a latex having a non-volatile content of from 50 to 80 percent by weight, and which cures to an elastomer upon removal of the water at room temperature.

4,618,646

ROOM TEMPERATURE-CURABLE ORGANOPOLYSILOXANE COMPOSITION

Toshio Takago; Masatoshi Arai, and Koji Futatsumori, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1985, Ser. No. 753,319
Claims priority, application Japan, Jul. 9, 1984, 59-141974
Int. Cl.[4] C08K *3/10*
U.S. Cl. 524—783 **3 Claims**

1. A room-curable organopolysiloxane composition which comprises:

(a) 100 parts by weight of a diorganopolysiloxane of a substantially linear molecular structure terminated at both molecular chain ends each with a silanolic hydroxy group;

(b) from 0.5 to 30 parts by weight of a compound having the formula R_bSiY_c, in which R is a monovalent hydrocarbon group, Y is a hydrolyzable group selected from the class consisting of alkoxy, acyloxy, alkenyloxy, ketoxime, substitute or unsubstituted amino, aminoxy, and amido groups, b is zero or 1 and c is 3 or 4 with the proviso that b+c is 4;

(c) from 5.0 to 300 parts by weight of a filler; and

(d) from 0.1 to 5.0 parts by weight of an organosilicon-modified polyoxyalkylene compound of which the molecular main chain is formed of the recurring units represented by the gneral formula —R^1—O—, in which R^1 is an ethylene or propylene group, and at least one of the molecular chain ends is terminated with a silicon-containing group represented by the general formula

$$—O)_mCH_2—CH_2(SiR_2—O)_nSiR_aX_{3-a}$$

in which X is a hydrolyzable group; R is a substituted or unsubstituted monovalent hydrocarbon group, m is zero or 1, n is zero or a positive integer and a is 1, 2 or 3.

4,618,647

PROCESS FOR PRODUCING A POLYMER WATER-IN-OIL EMULSION

You-Ling Fan, East Brunswick; George L. Brode, Somerville, both of N.J., and Meyer R. Rosen, Spring Valley, N.Y., assignors to Union Carbide Corp., Danbury, Conn.

Continuation of Ser. No. 474,420, Mar. 11, 1983, abandoned.
This application Nov. 26, 1984, Ser. No. 674,951
Int. Cl.[4] C08F *2/32*
U.S. Cl. 524—801 **29 Claims**

1. A process for producing water-in-oil emulsions of a polymer from at least one ethylenically-unsaturated monomer comprising the steps of

(a) forming an aqueous phase comprising an aqueous solution containing at least one ethylenically-unsaturated, water-soluble monomer;

(b) forming an oil phase comprising a hydrophobic liquid and an oil-soluble surfactant;

(c) blending said aqueous phase and oil phase to form a water-in-oil emulsion of said monomer;

(d) initiating polymerization of said monomer in said emulsion by heating said emulsion in the presence of a first polymerization initiator capable of initiating polymerization of said monomer at a temperature less than about 45° C.; and

(e) after a small amount of polymer is formed sufficient to provide a shear-stable monomer emulsion, completing said polymerization in the presence of a second polymerization initiator capable of initiating polymerization of said monomer at a second temperature which is both higher than about 40° C. and higher than said first temperature.

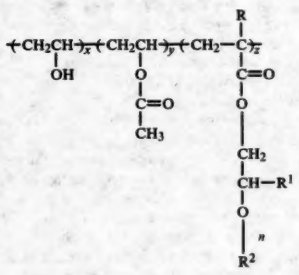
4,618,648

COPOLYMERS OF VINYL ALCOHOL AND POLY(ALKYLENEOXY)ACRYLATES

Finn L. Marten, Macungie, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 26, 1985, Ser. No. 727,638
Int. Cl.[4] C08F *16/06*
U.S. Cl. 525—60 **19 Claims**

1. A substantially homogeneous random vinyl alcohol copolymer comprising the following general structure:



wherein

R is hydrogen or methyl;

R^1 is hydrogen or methyl;

R^2 *is hydrogen,* C_1–C_{20} alkyl, C_6–C_{20} aryl or C_7–C_{30} alkylaryl;

n is a number from 1–1,000; provided n is not 1 when R^2 is hydrogen, methyl or ethyl;

x is 50–99.9 mole%;

y is 0–50 mole%; and

z is 0.001–50 mole%.

4,618,649
COPOLYMERS OF POLY(VINYL TRIFLUOROACETATE) OR POLY(VINYL ALCOHOL)

Ronald F. Ofstead, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 500,785, Jun. 3, 1983, Pat. No. 4,528,325. This application May 8, 1985, Ser. No. 731,915

The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.[4] C08F *16/06*

U.S. Cl. 525—60 **16 Claims**

1. A non-crosslinked poly(vinyl alcohol) copolymer which is the reaction product of:

a. a non-crosslinked poly(vinyl trifluoroacetate) copolymer having a molecular weight in the range of 200,000 to 4,000,000 which is the reaction product of:

1. 95 to 99.99 weight percent of vinyl trifluoroacetate monomer, and

2. 0.01 to 5 weight percent of a comonomer selected from vinyl esters, vinyl ethers, and copolymerizable disubstituted ethylenes; and

b. a mild base in a non-aqueous diluent selected so that the poly(vinyl trifluoroacetate) copolymer and its poly(vinyl alochol) copolymer solvolysis product are insoluble therein.

12. A process for preparing a poly(vinyl alcohol) copolymer comprising the steps:

a. admixing

(1) 95 to 99.99 weight percent of vinyl trifluoroacetate monomer, and

(2) 0.01 to 5 weight percent of a comonomer selected from vinyl esters, vinyl ethers, and disubstituted ethylenes,

b. allowing said admixture to react so as to form a poly(vinyl trifluoroacetate) copolymer having a molecular weight in the range of 200,000 to 4,000,000, and

c. solvolyzing ssid poly(vinyl trifluoroacetate) copolymer in a base in a non-aqueous diluent so as to produce said poly(vinyl alcohol) copolymer, said base in a non-aqueous diluent being selected so that the poly(vinyl trifluoroacetate) copolymer and the copolymeric poly(vinyl alcohol) solvolysis product are insoluble therein.

4,618,650
SILOXANE CONTAINING NETWORK POLYMER

Adel F. Halasa, Bath, and George Jalics, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 4, 1985, Ser. No. 772,484

Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—105 **19 Claims**

1. A process for crosslinking a metal terminated polymer comprising:

(a) reacting the metal terminated polymer with a molar excess of a halogenated silicon containing compound, wherein the halogenated silicon containing compound contains at least two halogen atoms which are bonded directly to a silicon atom, to produce a polymer which is terminated with halogenated silicon moieties wherein the halogenated silicon moieties contain at least one halogen atom which is bonded directly to a silicon atom;

(b) reacting the polymer which is terminated with halogenated silicon moieties with a molar excess of a tertiary alcohol to produce a polymer which is terminated with hydroxy silyl moieties; and

(c) allowing the polymer which is terminated with the hydroxy silyl moieties to crosslink under conditions sufficient to produce a crosslinked polymer containing siloxane linkages.

4,618,651
ADHESIVE COMPOSITIONS

Heinz Gilch, Bad Homburg-Kirdorf; Hubertus von Voithenberg, Bad Homburg, and Karl-Heinz Albert, Oberursel, all of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 595,595, Apr. 2, 1984, abandoned. This application Aug. 19, 1985, Ser. No. 766,592

Claims priority, application United Kingdom, Apr. 5, 1983, 8309129

Int. Cl.[4] C08L *23/00*

U.S. Cl. 525—130 **10 Claims**

1. A solvent free, adhesive composition capable of application to a workpiece in heat softened condition to provide a layer which after exposure to moisture is capable of activation by heat to a bond forming condition to form an adhesive bond, the composition comprising a minor amount of a tackifying resin and a moisture curable polyurethane formed from a first component comprising a diisocyanate, and a second component comprising a substantially linear hydroxy polyester diol having a crystalline melting point in the range 40° C. to 70° C. and a molecular weight in the range 1500 to 6000 in proportions to provide an NCO:OH ratio in the range 2.5:1 to 1.25:1 and to provide a prepolymer having from 1.0 to 2.0 percent by weight —NCO groups available for reaction, and a third component comprising a monofunctional reactant having as its sole reactive group an —OH or —NH_2 group, present in an amount sufficient to react with 1–40 mole % of the NCO groups of the product of the prepolymer reaction.

4,618,652
PROCESS FOR CURING BISMALEIMIDE RESINS

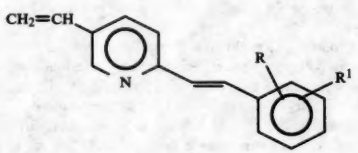
John A. Parker, Los Altos; Alvin H. Heimbuch, El Cerrito; Ming-ta S. Hsu, and Timothy S. Chen, both of San Jose, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 553,339, Nov. 18, 1983, Pat. No. 4,526,925. This application Apr. 22, 1985, Ser. No. 725,686

Int. Cl.[4] C08F *271/02*

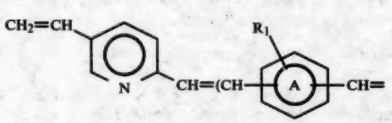
U.S. Cl. 525—282 **20 Claims**

1. In a process for thermally curing a bismaleimide resin into a solid polymer, the improvement comprising admixing with each 2.0 to 10 parts by weight of said bismaleimide resin, one part of a 5-vinyl-2-stilbazole of the structure

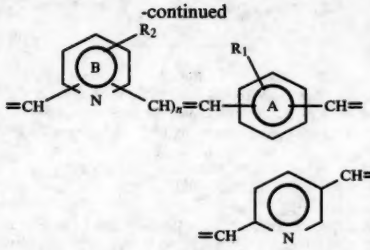


wherein R and R^1 are independently selected from hydrogen, lower alkyls, lower alkoxy, phenyls, bromo, chloro, or iodo and effecting the curing at a temperature of from about 130° C. to about 190° C.

14. In a process for thermally curing a bismaleimide resin into a polymer, the improvement comprising admixing with each 1.0 to 15 parts by weight of said bismaleimide resin one part by weight of a vinyl styrylpyridine oligomer of the structure



-continued



wherein in the A aromatic rings R_1 is hydrogen or lower alkyl and the two olefin bonds are attached to the aromatic ring meta or para to one another, and in the B aromatic ring R_2 is a lower alkyl, haloalkyl, or alkoxy and the two olefin bonds are attached to the B aromatic ring in the 2, 6 or 2, 4 positions, with R_2 in the 4 or 6 position not occupied by an olefin bond, and effecting the curing at a temperature in the range of from about 160° C. to about 230° C.

4,618,653

NOVEL POLYMER AND CURED PRODUCT OF THE SAME

Fumio Kawakubo; Miyako Takanoo; Sadao Yukimoto, and Katsuhiko Isayama, all of Kobe, Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Japan

Filed Apr. 25, 1985, Ser. No. 727,296

Claims priority, application Japan, Apr. 26, 1984, 59-84849

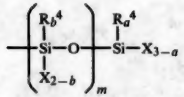
Int. Cl.[4] C08L *71/02*; C08F *283/06*

U.S. Cl. 525—404 **14 Claims**

1. A polymer which is prepared by addition polymerizing at least one ethylenically unsaturated monomer in the presence of:

(A) an organic polymer having a reactive silicone group of the formula:

(I)



wherein R^4 is a C_1–C_{20} alkyl group, a C_6–C_{20} aryl, a C_7–C_{20} aralkyl group or a triorganosiloxane group of the formula:

$(R'')_3SiO—$

in which R'' is, the same or different, a C_1–C_{20} hydrocarbon group, X is a hydroxyl group or, the same or different, a hydrolyzable group, a is an integer of 0 to 3, b is 0, 1 or 2 and m is an integer of 1 to 18 and a polymerizable ethylenically unsaturated group in a molecule, the total number of the reactive silicone group and the unsaturated group in a molecule being on the average not less than 1.1 and the number of the ethylenically unsaturated group being on the average not less than 0.1 and said polymer being selected from the group consisting of a polyalkyleneoxide, a polyester and a ether-ester block copolymer, and

(B) at least one component selected from the group of consisting of a radical polymerization initiator having a reactive silicone group (I), a chain transfer agent having a reactive silicone group (I) and a mixture thereof.

4,618,654

BASE MATERIAL FOR SILANE GRAFTED, CROSSLINKED THERMOPLASTIC OR ELASTOMERIC MATERIAL

Hans-Martin Schmidtchen, Osnabrück, and Hermann U. Voigt, Langenhagen, both of Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshuette, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 698,861, Jun. 23, 1976, abandoned. This application Nov. 16, 1982, Ser. No. 442,012

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1975, 2527935

Int. Cl.[4] C08F *275/00*

U.S. Cl. 525—288 **10 Claims**

1. In a method for making cross-linked thermoplastic or elastomeric material, comprising:

providing as a base material a blend (100%) of a component A and a component B, at a ratio of at least 50% by weight of component A to not more than 50% by weight, but at least 10% by weight of component B, wherein component A is comprised of a silane-graftable polyolefin or of one of its silane-graftable copolymers, and component B is a modifier being different from component A and having different physical properties, by being an elastomer or another polymer compatible with component A;

providing a mixture of the base material and of silane at 0.5 to 10 parts silane per 100 parts by weight graftable base material together with additives needed for grafting, such as a grafting initiator;

grafting the silane onto those macromolecules of the base material capable of receiving such silane; and

subsequently forming the material into the desired shape prior to final crosslinking of the graft material in the presence of moisture.

4,618,655

PROCESS FOR PREPARATION OF POLYMERS CONTAINING DICARBOXYLIC ACID CYCLIC IMIDE UNITS IN A SOLID/LIQUID SLURRY

David C. Dehm, Thornton, and H. Franklin Lawson, Downingtown, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 547,304, Oct. 31, 1983. This application Dec. 3, 1984, Ser. No. 677,656

Int. Cl.[4] C08F *8/36, 8/32*

U.S. Cl. 525—344 **5 Claims**

1. In the process for producing a sulfonated polymer containing styrene moieties and cyclic imide moieties by reacting a copolymer containing styrene moieties and cyclic carboxylic anhydride moieties with a primary amine followed by sulfonation,

the improvement comprises conducting the imidization of the anhydride moieties by reacting the primary amine with the copolymer slurried in an aromatic hydrocarbon having a boiling point greater than 120° C. and simultaneously removing water formed as the reaction proceeds, wherein the aromatic hydrocarbon does not dissolve the copolymer and the imidization reaction is conducted in a heterogenous slurry of the primary amine, the undissolved copolymer and the aromatic hydrocarbon.

4,618,656

NOVEL POLYMER AND CURED PRODUCT OF THE SAME

Fumio Kawakubo; Miyako Takanoo; Sadao Yukimoto, and Katsuhiko Isayama, all of Kobe, Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Japan

Filed Apr. 25, 1985, Ser. No. 727,295

Claims priority, application Japan, Apr. 26, 1984, 59-84848

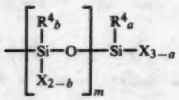
Int. Cl.[4] C08L *71/02*; C08F *283/06*

U.S. Cl. 525—404 **13 Claims**

1. A polymer which is prepared by addition polymerizing at

least one ethylenically unsaturated monomer in the presence of:

(A) an organic polymer having, in a molecule, at least one reactive silicone group of the formula:



(I)

wherein R^4 is a C_1–C_{20} alkyl group, a C_6–C_{20} aryl, a C_7–C_{20} aralkyl group or a triorganosiloxane group of the formula:

$(R'')_3SiO-$

in which R'' is, the same or different, C_1–C_{20} hydrocarbon group, X is a hydroxyl group or, the same or different, a hydrolyzable group, a is an integer of 0 to 3, b is 0, 1 or 2 and m is an integer of 1 to 18, said polymer being selected from the group consisting of a polyalkyleneoxide, a polyester and an ether-ester block copolymer,

(B) a compound having at least two independent ethylenically unsaturated group in a molecule, and

(C) at least one component selected from the group consisting of a radical polymerization initiator having a reactive silicone group (I), a chain transfer agent having a reactive silicone group (I) and a mixture thereof.

4,618,657

HEAT CURABLE POLYSILOXANE RELEASE COATINGS WHICH STRATIFY WHEN BAKED AND PAPER COATED THEREWITH

John Katchko, Palatine; Thomas H. Plaisance, Wilmette, and Karel Kriz, Mt. Prospect, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Mar. 11, 1985, Ser. No. 710,336
Int. Cl.[4] C08L *67/02*
U.S. Cl. 525—443 40 Claims

1. A heat curable coating composition adapted to deposit a release coating which stratifies to allow less silicone to coat a given surface area comprising:

(1) an hydroxy-functional resin;

(2) a cross-linking agent for the hydroxy-functional resin; and

(3) at least one reactive silicone resin to provide release properties,

said silicone resin being reactive with the hydroxy resin or the cross-linking agent, and components (1), (2) and (3) being compatible in liquid admixture.

4,618,658

POLYMER MODIFIED EPOXY RESIN COMPOSITIONS

Robert E. Hefner, Jr., and Virginia B. Messick, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 16, 1985, Ser. No. 734,516
Int. Cl.[4] C08L *63/10*
U.S. Cl. 525—454 13 Claims

1. A polymer modified epoxy resin composition which comprises a copolymerization product of

(A) from about one to about 99 percent by weight of an epoxy resin wherein from about 0.01 to about 10 mole percent of the epoxide groups have been reacted to provide groups containing polymerizable ethylenic unsaturation;

(B) from about one to about 99 percent by weight of at least one vinyl terminated urethane oligomer; and

(C) from about zero to about 75 percent by weight of one or more polymerizable ethylenically unsaturated compounds.

4,618,659

LOW MOLECULAR WEIGHT ACRYLIC POLYMERS

Charles M. Kania, Tarentum, and Rostyslaw Dowbenko, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 5, 1984, Ser. No. 678,435
Int. Cl.[4] C08F *283/04*
U.S. Cl. 525—455 23 Claims

1. An ungelled polymeric reaction product having a number average molecular weight of up to about 3000 and having a polydispersity of within 1.2 to 2.5 prepared by a process, comprising the vinyl addition polymerization of a vinyl monomer component of which at least 30 percent by weight is an active hydrogen-containing vinyl monomer, in the presence of an active hydrogen-containing polymer having a number average molecular weight of less than 3000.

4,618,660

POLYMERIZATION CATALYST

Victoria Graves, Crosby, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 626,172, Jun. 29, 1984, Pat. No. 4,554,265.
This application Aug. 30, 1985, Ser. No. 771,393
Int. Cl.[4] C08F *4/64*
U.S. Cl. 526—114 20 Claims

1. A process for polymerizing at least one alpha-olefin under conditions characteristic of Ziegler polymerization wherein the polymerization is conducted in the presence of a catalyst comprising:

I. A supported catalyst prepared under anhydrous conditions by the steps of:

(1) sequentially

(a) preparing a slurry of inert particulate support material;

(b) adding to said slurry a solution of an organomagnesium compound;

(c) adding to said slurry and reacting a solution of zirconium compound; and

(2) thereafter

(d) adding to said slurry and reacting a halogenator;

(e) adding to said slurry and reacting a tetravalent titanium compound;

(f) recovering solid catalyst; and

II. an organoaluminum compound.

4,618,661

SUPPORTED HIGH EFFICIENCY POLYOLEFIN CATALYST COMPONENT AND METHODS OF MAKING AND USING THE SAME

Malcolm J. Kaus, Humble, Tex., and Nemesio D. Miro, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 543,166, Oct. 19, 1983, abandoned, and a continuation-in-part of Ser. No. 535,630, Sep. 26, 1983, abandoned, which is a division of Ser. No. 389,619, Jun. 18, 1982, Pat. No. 4,422,957, which is a division of Ser. No. 146,341, May 2, 1980, Pat. No. 4,347,158, said Ser. No. 543,166, is a division of Ser. No. 252,661, Apr. 22, 1981, Pat. No. 4,425,257, which is a continuation-in-part of Ser. No. 146,341,.
This application Jul. 12, 1985, Ser. No. 754,311
Int. Cl.[4] C08F *4/62, 4/64, 4/68*
U.S. Cl. 526—114 28 Claims

1. A process for the polymerization of olefins comprising contacting an alpha-olefin or a mixture of alpha-olefins under suitable reaction conditions with a catalyst system comprising a catalyst and a cocatalyst, wherein the cocatalyst comprises an organometallic compound and the catalyst comprises a solid resulting from the interaction of reactants consisting essentially of a support base selected from magnesium and manganese dihalides; a second solid material selected from aluminum

trihalides, phosphorus trichloride, and phosphorus oxyrichloride; a first electron donor selected from ethers and non-halogenated esters of carboxylic acids; and a polymerization active tritetra-, or penta-valent transition metal compound of a Group IVB–VIB metal; said catalyst being prepared by co-comminuting said support base and said second solid material to form an anhydrous mixture, co-comminuting the anhydrous mixture with said first electron donor to form a catalyst support, and treating said catalyst support with, said transition metal compound.

4,618,662

CATALYST COMPOSITION FOR POLYMERIZING ALPHA-OLEFINS

Thomas E. Nowlin, Yanbu, Saudi Arabia, assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 23, 1984, Ser. No. 603,048
Int. Cl.[4] C08F *4/02, 10/00*
U.S. Cl. 526—129 **88 Claims**

1. A process for preparing a supported catalyst composition for use in alpha-olefin polymerization reactions, said process consisting essentially of the following steps in the recited order:

(i) contacting a solid, porous carrier having reactive OH groups with a liquid, said liquid containing at least one organomagnesium composition having the empirical formula

$$R_nMgR'_{(2-n)} \quad (I)$$

where R and R′ are the same or different and they are C_1–C_{12} hydrocarbyl groups, provided that R′ may also be halogen, and n is 0, 1, or 2, the number of moles of said organomagnesium composition being in excess of the number of moles of said OH groups on said carrier;

(ii) removing said liquid from step (i) to obtain a magnesium-containing carrier in the form of a dry, free-flowing powder; and

(iii) contacting said powder of step (ii) with a solution comprising a liquid medium, an aluminum-containing brominating and/or chlorinating agent having the formula:

$$R'''_pAlX_{(3-p)}$$

wherein R‴ is a C_1–C_{12} branched or unbranched alkyl group, X is bromine or chlorine, and p is 1 or 2, and at least one titanium (IV) alkoxide compound having the formula :

$$Ti(OR'')_m$$

wherein R″ is branched or unbranched alkyl radical of 1 to 20 carbon atoms and m is 4, said titanium (IV) alkoxide compound, said brominating and/or chlorinating agent being soluble in said liquid medium, and said magnesium-containing carrier being substantially insoluble in said liquid medium,

whereby a compound of titanium which is insoluble in said liquid medium becomes incorporated onto said carrier.

4,618,663

PROCESS FOR PREPARING α-METHYLSTYRENE-ACRYLONITRILE COPOLYMERS

Masao Nakagawa, Kobe, Japan, assignor to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 23, 1983, Ser. No. 535,262
Claims priority, application Japan, Oct. 1, 1982, 57-173738
Int. Cl.[4] C08F *4/36, 220/44*
U.S. Cl. 526—232.3 **14 Claims**

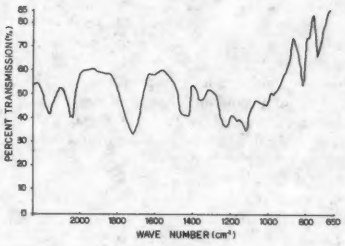
1. A process for preparing a copolymer having improved transparency at high conversion levels which comprises copolymerizing 10 to 80% by weight of α-methylstyrene, 5 to 50% by weight of acrylonitrile and 0 to 70% by weight of at least one member selected from the group consisting of styrene, methyl methacrylate, vinyl toluene and t-butylstyrene in the presence of a difunctional organic peroxide as an initiator at a temperature of 80° to 120° C. in a suspension or bulk polymerization manner.

4,618,664

PULLULAN COPOLYMER

Yasuhiko Ohnishi, Seto, Japan, assignor to Sadayoshi Kumiya, Nagoya, Japan, a part interest

Filed Jan. 9, 1985, Ser. No. 689,928
Claims priority, application Japan, Jan. 9, 1984, 59-002345
Int. Cl.[4] C08G *89/00*; C08F *36/00*
U.S. Cl. 527—300 **4 Claims**



1. A pullulan copolymer obtained by reacting pullulan with an unsaturated acid of the formula $HOOCR^{10}$ or the anhydride thereof in which R^{10} is an unsaturated hydrocarbon group having a carbon-carbon double bond and 2 to 16 carbon atoms, in the presence of a saturated acid of the formula $HOOCR^{11}$ in which R^{11} is an alkyl group having 2 to 16 carbon atoms and an acid catalyst to produce a pullulan olefin ester of formula (A):

$$[C_6H_7O_2(OH)_{3-a-b}(OX)_a(OY)_b]_mH_2O \quad (A)$$

where

X is —C(=O)R^1 and R^1 is an unsaturated hydrocarbon group derived from an unsaturated acid and having a carbon-carbon double bond and 2 to 16 carbon atoms,

Y is —C(=O)R^2 and R^2 is an alkyl group having 1 to 14 carbon atoms, m is a natural number of at least 5, and a and b each is a natural number defined by $a+b \leqq 3$

and copolymerizing said pullulan olefinic ester with an olefinic compound polymerizable to form a recurring unit of formula (B):

$$[C(R^3)R^4—C(R^5)R^6]_n \quad (B)$$

where

R^3, R^4 and R^5 are each selected from hydrogen and CH_3;

R^6 is selected from —C(=O)OR^7, —C(=O)CN, —OH, acyloxy, phenyl, pyridine, tolyl, pyrrolidone, lower alkyl and substituted pyrrolidone groups, R^7 being selected from an alkyl group having 1 to 12 carbon atoms, a cyclohexyl group, a hydroxyalkyl group having 1 to 4 carbon atoms, an aminoalkyl group having 1 to 8 carbon atoms, a dialkyl aminoalkyl group having 1 to 8 carbon atoms, a glycidyl group, a tetrahydrofuran group, a lower alkyl substituted tetrahydrofuran group having 1 to 4 carbon atoms, a benzyl group, a polyethylene oxide group having a polymerization degree of 2 to 11 and an imino group; and

n is a natural number of 20 to 300,000.

4,618,665

PROCESS TO PREPARE 2-PHENYLPROPYL CONTAINING POLYDIORGANOSILOXANES

Joseph T. Braun, and Schuyler B. Smith, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 13, 1986, Ser. No. 818,150
Int. Cl.[4] C08G 77/04
U.S. Cl. 528—25 15 Claims

1. A method of preparing hydroxyl endblocked copolymers with methyl(2-phenylpropyl)disiloxanediol and dialkylcyclosiloxane consisting essentially of

(A) adding to a reaction vessel containing distilled water and water miscible solvent in a ratio of from about 1:2 to 2:1, methyl(2-phenylpropyl)dichlorosilane, at a slow rate with stirring so that the temperature is maintained between 20° C. and 45° C., and the maxiumum HCl concentration is 5 Normal, then

(B) cooling to below 35° C. and separating the reaction product from the acidified water, then

(C) dissolving the reaction product in solvent, then

(D) washing with saturated sodium bicarbonate solution, followed by distilled water to give a pH of about 7, then

(E) removing solvent to give a product of primarily methyl(2-phenylpropyl)disiloxanediol, then

(F) mixing with sufficient dialkylcyclosiloxane to give the desired mol ratio of radicals and heating, then

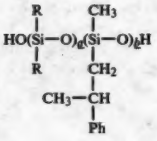
(G) adding powdered potassium hydroxide and heating to equilibrate, then

(H) removing the water from the composition by use of a water trap and heating to reflux, then

(I) cooling rapidly to about 65° C. and neutralizing with CO_2, then

(J) filtering and stripping under vacuum

to yield a copolymer having the formula



where Ph is phenyl, R is methyl, ethyl, propyl, trifluoropropyl, a is from 3 to 500 and b is from 2 to 500 with a being at least equal to b.

4,618,666

DISILANE/ORGANOSILICON RESIN HAVING ENHANCED THERMOMECHANICAL PROPERTIES

Hugues Porte, Lyons, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed May 20, 1985, Ser. No. 735,994
Claims priority, application France, May 18, 1984, 84 07725
Int. Cl.[4] C08G 77/04
U.S. Cl. 528—33 22 Claims

1. An organosilicon resin containing recurring disilane units, which comprises the reaction product of a simultaneous cohydrolysis and condensation reaction in a heterogeneous solvent medium of an admixture of organochlorosilanes and organochlorodisilanes, said admixture comprising:

(i) from about 10 to 70 molar % of at least one diorganochlorosilane having the formula R_2SiCl_2, in which the radicals R, which may be identical or different, are each hydrogen, methyl or phenyl;

(ii) from about 30 to 70 molar % of at least one methylchlorodisilane which comprises at least about 30 molar % of tetrachloro-1,2-dimethyldisilane; and

(iii) from 0 to about 60 molar % of at least one organotrichlorosilane having the formula $R'SiCl_3$, in which R' is defined as is R above;

and said resin having an average functionality of from about 2.2 to 3.

4,618,667

NUCLEATION OF URETHANE COMPOSITIONS

Edward L. Kay, Akron, and Kenneth B. Roskos, Clinton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 18, 1985, Ser. No. 724,692
Int. Cl.[4] C08G 18/32, 18/34, 18/30
U.S. Cl. 528—49 23 Claims

1. An essentially phase free separation pattern urethane elastomer composition, comprising:

a urethane prepolymer having free polyisocyanate therein;

from about 0.01% to about 5.0% by weight based upon the weight of said prepolymer of a fine nucleating agent, said fine nucleating agent uniformly dispersed in said prepolymer whereby a nucleating agent-prepolymer blend is formed, a chain extender, said chain extender added to said formed nucleating agent-prepolymer blend, said nucleating agent prepolymer blend cured by said chain extender at a curing temperature so that the urethane composition is essentially free of phase separation patterns.

9. A process for producing urethane elastomers which are essentially free from phase separation patterns, comprising the steps of:

adding urethane prepolymers containing free polyisocyanate therein to a vessel;

adding from about 0.01% to about 5.0% by weight based upon the weight of said prepolymer of a nucleating agent;

mixing said prepolymer and said nucleating agent so that said nucleating agent is uniformly dispersed throughout said prepolymer,

subsequently adding a chain extender to said nucleating agent-prepolymer mixture, and

curing said nucleating agent-prepolymer mixture.

4,618,668

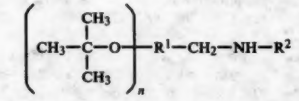
PREPARATION OF POLYPHENYLENE ETHERS

Volker Muench, Ludwigshafen; Juergen Hambrecht, Heidelberg; Walter Himmele, Walldorf; Adolf Echte, and Johann Swoboda, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 11, 1985, Ser. No. 722,154
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414237
Int. Cl.[4] C08G 65/44, 65/46
U.S. Cl. 528—215 3 Claims

1. A process for the preparation of a high molecular weight polyphenylene ether from a monohydric phenol which possesses alkyl substituents in the two ortho positions and may additionally possess an alkyl substituent in a meta position but not in the para position, by an oxidative coupling reaction with oxygen at from 10° to 50° C. in the presence of a ctalyst complex consisting of a copper salt and an organic amine and in the presence of an aromatic C_6–C_{10}-hydrocarbon as solvent, in an amount of from 1 to 20 parts by weight per part by weight of the monomeric phenol, and in the presence or absence of an activator, the reaction is terminated, the copper component is separated from the reaction mixture and the high molecular weight polyphenylene ether is isolated from the solution, wherein the amine component used in the catalyst complex is an amine of the formula I

(I)



where R^1 is C_2–C_{20}-alkylidene or alkenylidene, R^2 is H or C_1–C_{12}-alkyl or C_5–C_8-cycloalkyl, each of which is unsubstituted or substituted by $—OR^3$, $—NHR^3$ or $—SR^3$, where R^3 is H, C_1–C_{12}-alkyl or C_5–C_8-cycloalkyl, and n is an integer from 1 to 4.

4,618,669

S-(CARBAMOYL-PHENYLSELENYL) DERIVATIVES OF GLUTATHIONE AND OF AMINOMERCAPTOCARBOXYLIC ACIDS

Norbert Dereu, Frechen-Bachem; André Welter, Pulheim; Albrecht Wendel; Sigurd Leyck, both of Tübingen; Michael Parnham, Pulheim; Erich Graf, Kerpen; Helmut Sies, Neuss; Hans Betzing, Kerpen-Horrem, and Hartmut Fischer, Cologne, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

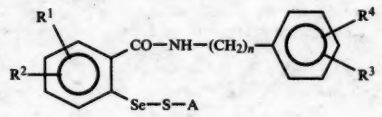
Filed Jun. 14, 1985, Ser. No. 744,920

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1984, 3422962; Nov. 29, 1984, 3443468

Int. Cl.[4] C07K *5/08;* **C07C** *149/40, 121/50*

U.S. Cl. 530—331 **3 Claims**

1. S-(Carbamoyl-phenylselenyl) derivatives of glutathione and of α-aminomercaptocarboxylic acids according to the general formula (I)



(I)

wherein

R^1, R^2, R^3 and R^4, represent members selected from the group consisting of hydrogen, halogen, C_{1-4}-alkyl, C_{1-4}-alkoxy, trifluoromethyl, nitro, cyano, hydroxy, carboxy and C_{1-4}-alkoxycarbonyl,

n is zero or an integer from 1 to 4 and

A is a member selected from the group consisting of the glutathione radical, the α-amino acid radicals, the α-amino acid radicals wherein the carboxylic group and the amino group are unsubstituted the α-amino acid radicals wherein the carboxylic group is esterified with a C_{1-3}-alcohol and the amino group is unsubstituted, the α-amino acid radicals wherein the amino group is acylated and the carboxylic group is unsubstituted, and the α-amino acid radicals wherein both the carboxylic group is esterified with a C_{1-3}-alcohol and the amino group is acylate

---

4,618,670

METHOD FOR PRODUCTION OF USEFUL SUBSTANCES FROM SOYMEAL

Giorgio Colmelet, Milan, Italy, assignor to Novavis Intercontinental, Ltd., San Mateo, Calif.

Continuation-in-part of Ser. No. 587,838, Mar. 12, 1984, abandoned, which is a continuation of Ser. No. 516,285, Jul. 22, 1983, abandoned. This application Mar. 19, 1985, Ser. No. 713,586

Int. Cl.[4] A23J *1/14;* **C07K** *3/28*

U.S. Cl. 530—378 **20 Claims**

1. A method for recovering useful products from de-oiled soymeal comprising the steps of

(a) extracting said residue with aqueous liquid at a temperature in the range of 60°-95° C.;

(b) separating the liquid extract from step (a), from said residue;

(c) subjecting said residue from step (b) to aqueous acidic hydrolyzing conditions;

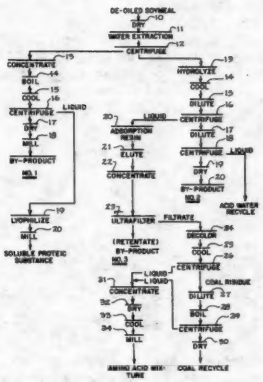
(d) separating the liquid phase from the mixture in step (c) from said residue;

(e) contacting said liquid phase with a cationic sulfonated resin;

(f) eluting amino acids from said resin with aqueous base;

(g) subjecting the eluate of step (f) to ultrafiltration;

(h) purifying the filtrate from step (g) on carbonaceous adsorbent;



(i) separating amino acid containing liquid from said carbonaceous adsorbent.

4,618,671

4-METHYL-PYRIDONE MONOAZO COMPOUND HAVING BOTH MONOCHLOROTRIAZINYL AND VINYLSULFONE TYPE FIBER-REACTIVE GROUPS

Yutaka Kayane, Ibaraki; Tetsuya Miyamoto, Takatsuki; Takashi Omura, Ashiya; Hirokazu Sawamoto, Minoo; Naoki Harada, Ibaraki, and Akira Takeshita, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

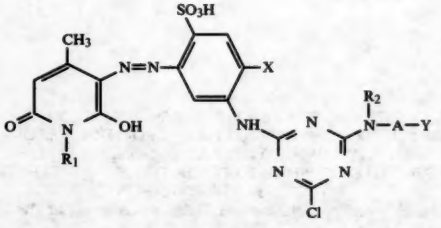
Filed Dec. 17, 1984, Ser. No. 682,241

Claims priority, application Japan, Jul. 31, 1984, 59-162740

Int. Cl.[4] C09B *62/085, 62/53;* **D06P** *1/382, 3/66*

U.S. Cl. 534—635 **6 Claims**

1. A compound of the following formula, or a salt thereof,



wherein R_1 and R_2 are independently hydrogen or lower alkyl having up to 4 carbon atoms, X is hydrogen, methyl or sulfo, A is phenylene unsubstituted or substituted with one or two substituents selected from the group consisting of chlorine, bromine, methyl, ethyl, methoxy, ethoxy and sulfo, or naphthylene unsubstituted or substituted with one sulfo, and Y is $—SO_2CH=CH_2$ or $—SO_2CH_2CH_2Z$, in which Z is a group capable of being split by the action of an alkali.

4,618,672

BISAZO COMPOUNDS USEFUL AS CHARGE GENERATING PIGMENTS IN ELECTROPHOTOGRAPHY

Mitsuru Hashimoto, Numazu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

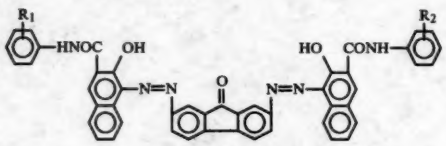
Filed Apr. 21, 1981, Ser. No. 256,162

Claims priority, application Japan, Apr. 30, 1980, 55-56234; Apr. 30, 1980, 55-56235; Apr. 30, 1980, 55-56236; Dec. 1, 1980, 55-169391; Dec. 1, 1980, 55-169392; Dec. 1, 1980, 55-169393; Dec. 1, 1980, 55-169394

Int. Cl.[4] C09B *35/037, 35/10, 35/20, 35/233*

U.S. Cl. 534—658 **10 Claims**

1. A bisazo compund of the formula



wherein R_1 and R_2 each represent a halogen selected from the group consisting of fluorine, chlorine, bromine and iodine, and

when R_1 or R_2 is fluorine, it is present at the ortho, para or meta position in each phenylcarbamoyl group;

when R_1 or R_2 is chlorine, it is at the ortho position in each phenylcarbamoyl group;

when R_1 or R_2 is bromine, it is at the ortho or meta position in each phenylcarbamoyl group; and

when R_1 or R_2 is iodine, it is at the meta position in each phenylcarbamoyl group.

4,618,673

SALTS OF THE 1:2 CHROMIUM COMPLEX OF 4-(5'-CHLORO-2'-HYDROXY-3'-SULFOPHENYLAZO)-3-METHYL-1-PHENYLPYRAZOL-5-ONE AND 4-(3',5'-DICHLORO-2'-HYDROXYPHENYLAZO)-3-METHYL-1-PHENYLPYRAZOL-5-ONE

Jacky Dorë, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

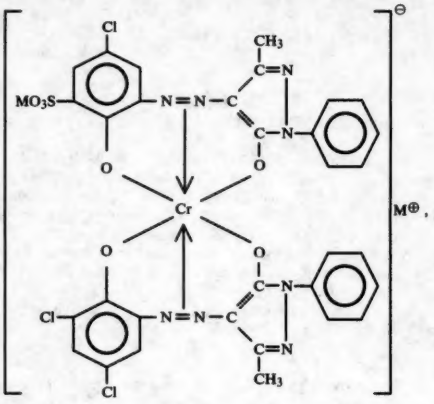
Continuation of Ser. No. 880,446, Feb. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 716,139, Aug. 20, 1976, abandoned. This application Sep. 22, 1981, Ser. No. 304,621

Claims priority, application Switzerland, Aug. 27, 1975, 11099/75

Int. Cl.[4] C09B *45/06, 45/16;* **D06P** *1/10*

U.S. Cl. 534—698 **2 Claims**

1. A complex of the formula



wherein

$M^{\oplus}$ is hydrogen or a non-chromophoric cation, and

M is a non-chromophoric cation.

2. The complex according to claim 1 wherein

$M^{\oplus}$ is sodium, and

M is sodium.

4,618,674

RED-1-(CYANOPHENYLAZO- OR CYANO, HALOPHENYLAZO)-2-AMINO-8-HYDROXYNAPHTHALENE-6 SULFONIC ACID DYESTUFFS

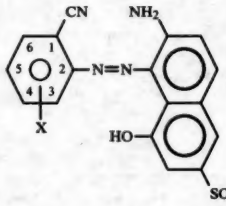
Kurt A. Dellian, 2101 Wakefield Rd., Greensboro, N.C. 27410

Filed Dec. 30, 1983, Ser. No. 567,295

Int. Cl.[4] C09B *29/01, 29/30, 67/22;* **D06P** *1/39*

U.S. Cl. 534—878 **5 Claims**

1. A dye of the formula



wherein X is hydrogen or halogen and M is a colorless cation.

4,618,675

DERIVATIVES AND REDUCTION PRODUCTS OF D-GLUCOPYRANOSYL-ALPHA(1→5)-D-ARABINONIC ACID; AND PRODUCTION OF SAME

Frieder W. Lichtenthaler, Mühltal, and Roger G. Klimesch, Alsbach-Hahnlein, both of Fed. Rep. of Germany, assignors to Suddeutsche Zucker-Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

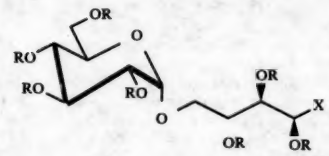
Filed Dec. 16, 1983, Ser. No. 562,135

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 3248404

Int. Cl.[4] C07H *15/04*

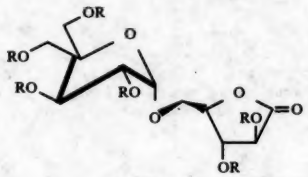
U.S. Cl. 536—17.2 **19 Claims**

1. Derivatives of D-glucopyranosyl-alpha-(1→5)-D-arabinonic acid of the formula:



(I)

wherein X is a member selected from the group consisting of —COOM, —COOR', —$CONH_2$, and —CH_2OH, and M is an alkali metal and R' is an alkyl group having 1 to 20 carbon atoms; and wherein R is a hydrogen atom or an acyl group having 1 to 20 carbon atoms;
the compounds of formula (I) including those aliphatic acid group is closed in a lactone ring represented by the formula:



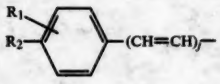
wherein R has the same meaning as set forth above.

4,618,676
PREPARATION OF N,N',N"-TRIS-(2-HYDROXYPROPYL)-MELAMINE
Klaus Ebel, Ludwigshafen, and Wolfgang Reuther, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Oct. 15, 1985, Ser. No. 787,087
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1984, 3438387
Int. Cl.[4] C07D *251/70*
U.S. Cl. 544—196 **5 Claims**

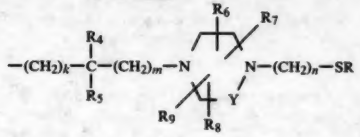
1. In a process for the preparation of N,N',N"-tris-(2-hydroxypropyl)-melamine by reacting melamine with isopropanolamine in the presence of an acidic catalyst and at a temperature of from 120° to 300° C., the improvement which comprises: maintaining the molar ratio of free isopropanolamine to the sum of free and converted melamine at a level of at least 4:1 during the entire reaction time.

4,618,677
SUBSTITUTED PHENYLALKYL-(PIPERAZINYL OR HOMOPIPERAZINYL)ALKYL-THIOLS AND -THIOCARBAMATES USEFUL FOR THE TREATMENT OF IMMUNOLOGICAL, INFLAMMATORY, AND ALLERGIC DISORDERS
Karl D. Hargrave, Brookfield Center; John P. Devlin, Sharon, and Edward A. Barsumian, Danbury, all of Conn., assignors to Boehringer Ingelheim Limited, Ridgefield, Conn.
Continuation-in-part of Ser. No. 499,188, May 31, 1984, abandoned. This application Nov. 5, 1984, Ser. No. 668,089
Int. Cl.[4] C07D *241/38;* **A61K** *31/495*
U.S. Cl. 544—400 **27 Claims**

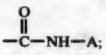
1. A compound of the formula



-continued



wherein
R is hydrogen or



A is alkyl of 1 to 8 carbon atoms; cycloalkyl of 3 to 7 carbon atoms; phenyl; phenyl mono- or di-substituted independently with alkyl of 1 to 4 carbon atoms, halogen, trihalomethyl, alkoxy or 1 to 3 carbon atoms, carboxylic acyl or 1 to 3 carbon atoms, carboxyl, (alkoxy of 1 to 3 carbon atoms) carbonyl, nitro, cyano or di(alkyl of 1 to 3 carbon atoms)amino; or phenyl tri-substituted with alkoxy of 1 to 3 carbon atoms;
R_1 and R_2 are independently hydrogen, halogen, alkyl of 1 to 4 carbon atoms, trihalocmethyl, nitro, cyano, di(alkyl of 1 to 4 carbon atoms)- amino, (alkoxy of 1 to 4 carbon atoms)carbonyl, alkoxy of 1 to 4 carbon atoms or hydroxyl;
R_4 and R_5 are indenpendently hydrogen; alkyl of 1 to 4 carbon atoms, or phenyl;
R_6, R_7, R_8 and R_9 are independently hydrogen or methyl;
Y is —CH_2—;
j is 0 or 1;
k and m are independently 0, 1, 2, or 3, their sum being no more than 6 and must be 0 when j is 1;
n is 2, 3, or 4, with the proviso that n must be 3 or 4 when R_1 is hydrogen or 2-methyl, R_2, R_4, R_5, R_6, R_7, R_8, R_9 and R are ach hydrogen and j, k, and m are each 0, and Y is —CH_2—;
or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

27. The method of suppressing allergic reactions or inflammation in a warm-blooded animal in need thereof, which comprises topically administering to said animal an effective antiallergic or anti-inflammatory amount of a compound of claim 1.

4,618,678
4-(2,3-DICHLORO-6-FLUOROPHENYL)-1,4,5,6,7,8-HEXAHYDRO-2-METHYL-5-OXO-1,7-NAPHTHYRIDINE-3-CARBOXYLIC ACID 2-(2,3-DICHLOROPHENOXY)ETHYL ESTER
Theodore S. Sulkowski, Wayne; Paul J. Silver, West Chester, and Albert A. Mascitti, Norristown, all of Pa., assignors to American Home Products Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 760,220, Jul. 29, 1985. This application Dec. 17, 1985, Ser. No. 809,962
The portion of the term of this patent subsequent to Jun. 14, 2003, has been disclaimed.
Int. Cl.[4] C07D *471/02*
U.S. Cl. 546—123 **1 Claim**

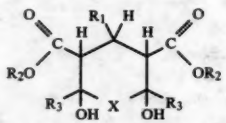
1. The compound which is 4-(2,3-dichloro-6-fluorophenyl)-1,4,5,6,7,8-hexahydro-2-methyl-5-oxo-1,7-naphthyridine-3-carboxylic acid 2-(2,3-dichlorophenoxy)ethyl ester or a pharmaceutically acceptable salt thereof.

4,618,679
3,5-DICARBOXYLIC ACID ESTERS OF 2,6-BIS(FLUORO-ALKYL)-2,6-BIS(HYDROXY) PIPERIDINES

Len F. Lee, St. Charles, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 522,271, Aug. 11, 1983, abandoned. This application Apr. 24, 1984, Ser. No. 602,023
Int. Cl.[4] C07D *211/60, 309/08;* A01N *43/40, 43/16*
U.S. Cl. 546—220 4 Claims

1. A compound of the formula



wherein X is NH and wherein R_1 is selected from branched-chain lower alkyl, alkoxyalkyl, alkylthioalkyl, cycloalkyl, and cycloalkanylalkyl radicals, R_2 is a C_{1-4} alkyl radical and R_3 represents a C_{1-4} fluoroalkyl radical.

4,618,680
BENZANILIDE DERIVATIVE

Robert F. Mayol, and Richard E. Gammans, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Continuation of Ser. No. 188,184, Sep. 18, 1980, Pat. No. 4,332,803. This application Nov. 27, 1981, Ser. No. 325,166
The portion of the term of this patent subsequent to Jun. 1, 1999, has been disclaimed.
Int. Cl.[4] C07D *211/26*
U.S. Cl. 546—234 1 Claim

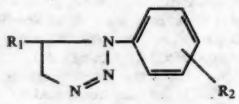
1. 4-Hydroxy-3-methoxy-N-[2-[2-(1-methyl-2-piperidinyl)ethyl]phenyl]benzamide.

4,618,681
ARYL SUBSTITUTED 1H-4,5-DIHYDRO-1,2,3-TRIAZOLES AS ANTICONVULSANTS

Pankaja K. Kadaba, Lexington, Ky., assignor to The University of Kentucky Research Foundation, Lexington, Ky.

Continuation-in-part of Ser. No. 476,792, Mar. 18, 1983, Pat. No. 4,511,572. This application Jul. 10, 1984, Ser. No. 629,554
Int. Cl.[4] C07D *401/04*
U.S. Cl. 546—276 9 Claims

1. A compound of the following formula:



wherein R_1 is 4-pyridyl, 3-pyridyl, 2-pyridyl, or orthochlorophenyl, and R_2 is hydrogen, p-fluoro, m-chloro-p-fluoro, m- or p-trifluoromethyl, p-ethyl, or m-chloro, and when R_1 is orthochlorophenyl, R_2 is trifluoromethyl, and when R_2 is hydrogen, R_1 is 2-pyridyl.

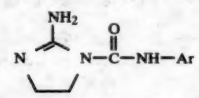
4,618,682
2-AMINO-4,5-DIHYDRO-1H-IMIDAZOLE-1-CARBOXANILIDES

Leonard R. Hecker, Ambler, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Division of Ser. No. 514,541, Jul. 18, 1983, Pat. No. 4,513,140, which is a division of Ser. No. 316,601, Oct. 30, 1981, abandoned. This application Jan. 14, 1985, Ser. No. 691,105
Int. Cl.[4] C07D *233/46*
U.S. Cl. 548—315 19 Claims

1. A compound selected from the group consisting of

(a) a 2-amino-4,5-dihydro-1H-imidazole-1-carboxanilide of the formula



I

wherein Ar is phenyl substituted with from 0 to 3 substituents independently selected from the group consisting of fluoro, chloro, bromo, methyl, ethyl, methoxy, ethoxy, trifluoromethyl and methylthio, and

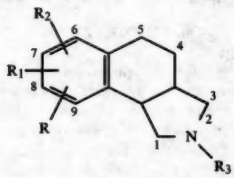
(b) a pharmaceutically acceptable salt thereof.

4,618,683
TETRAHYDRO-6,7-DIMETHOXY-1H-BENZ-[E]ISOINODOLINES USEFUL IN THE TREATMENT OF HYPERTENSION AND AS SEDATIVES

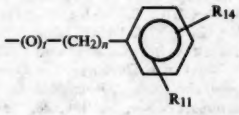
John F. DeBernardis, Lake Villa; Daniel J. Kerkman, Gurnee, and William J. McClellan, Waukegan, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 383,631, Jun. 1, 1982, abandoned. This application Nov. 20, 1984, Ser. No. 673,458
Int. Cl.[4] C07D *491/02;* A61K *31/40*
U.S. Cl. 548—420 17 Claims

1. A compound of the formula



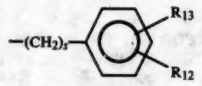
wherein R, R_1 and R_2 are independently selected from hydrogen, loweralkyl of 1 to 4 carbon atoms, hydroxy, loweralkoxy of 1 to 3 carbon atoms, allyloxy, benzyloxy, benzoyloxy, thiomethyl, halo, or



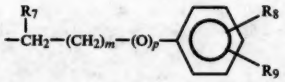
wherein t is 0 or 1, n is 0 to 5, and R_{11} and R_{14} are independently selected from hydrogen, halo, hydroxy, loweralkyl of 1 to 4 carbon atoms, loweralkoxy of 1 to 3 carbon atoms or amino; or

R and R_1, or R_1 and R_2 can be taken together to form a methylenedioxy or ethylenedioxy bridge; with the proviso that at least one of R, R_1 or R_2 must be other than hydrogen and the proviso that two of R, R_1 or R_2 must be other than methoxy in the 7 and 8 positions when the remaining one of R, R_1 or R_2 is hydrogen; and

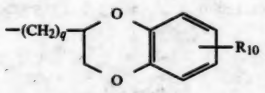
R_3 is hydrogen, loweralkyl of 1 to 4 carbon atoms, halo-substituted loweralkyl of 1 to 4 carbon atoms, amino-substituted loweralkyl of 1 to 4 carbon atoms, amino-substituted arylalkyl, allyl, thioloweralkyl, loweralkanol, or



wherein R_{12} and R_{13} are independently selected from hydrogen, hydroxy, amino, loweralkoxy of 1 to 3 carbon atoms and s is 1 to 3; or



wherein m is 0, 1 or 2, p is 0 or 1, R_7 is hydrogen or loweralkyl of 1 to 4 carbon atoms and R_8 and R_9 are independently selected from hydrogen, hydroxy, methoxy, loweralkyl of 1 to 4 carbon atoms, or halo, or R_8 and R_9 can be taken together to form a methylenedioxy or ethylenedioxy bridge; or 1,4-benzodioxan of the formula



wherein q is 1, 2 or 3, and R_{10} is hydrogen, methoxy, amino, or halo; and the pharmaceutically acceptable salts thereof.

17. A pharmaceutical composition for sedation or treating hypertension comprising a pharmaceutical carrier and sedative or antihypertensive effective amount of the compound of claim 1.

4,618,684

SUBSTITUTED INDOLES

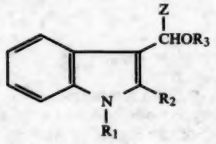
Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Division of Ser. No. 288,495, Jul. 30, 1981, Pat. No. 4,485,242, which is a division of Ser. No. 127,648, Mar. 6, 1980, Pat. No. 4,307,898. This application Jul. 13, 1984, Ser. No. 630,911

Int. Cl.[4] C07D *209/12*

U.S. Cl. 548—455 **2 Claims**

1. A compound having the formula



wherein:

R_1 is hydrogen or lower-alkyl;

R_2 is hydrogen, lower-alkyl or phenyl;

R_3 is di-lower-alkylamino-lower-alkyl or tri-lower-alkylammonium-lower-alkyl, and

Z is phenyl, tolyl or lower-alkoxyphenyl.

4,618,685

N-HOMOCYSTEINE THIOLACTONYL RETINAMIDE AND USE THEREOF AS AN ANTINEOPLASTIC AGENT

Kilmer S. McCully, 15 Wildwood St., Winchester, Mass. 01890

Filed Dec. 18, 1985, Ser. No. 810,175

Int. Cl.[4] C07D *333/36;* **A61K** *31/38*

U.S. Cl. 549—63 **1 Claim**

1. N-homocysteine thiolactonyl retinamide.

4,618,686

PROCESS FOR DEHALOGENATION OF ARYL AND ALPHA-ARALIPHATIC HALIDES

Stephen K. Boyer, Far Hills, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 27, 1984, Ser. No. 655,279

Int. Cl.[4] C07B *61/00;* **C07D** *319/24*

U.S. Cl. 549—360 **15 Claims**

1. A process for the dehalogenation of a compound selected from a (carbocyclic or heterocyclic) aromatic halide and an alpha-(carbocyclic or heterocyclic) aromatic-aliphatic halide wherein said carbocyclic or heterocyclic aromatic group is selected from

phenyl, naphthyl, biphenyl, anthracenyl, phenanthrenyl, quinolinyl, isoquinolinyl, carbazole, purinyl, pyridinyl, pyrimidinyl, pyrazolyl, imidazolyl, furanyl, oxazolyl, indolyl, benzofuranyl, benzoquinolinyl, and dibenzodioxinyl,

each of said carbocyclic or heterocyclic aromatic groups being further unsubstituted or further substituted by a substituent selected from

cyano, nitro, —NHR, —$N(R)_2$, —COOR, —CONHR, —$CON(R)_2$, —OR, —C(O)R, —OOCR, —NHC(O)R, —SO_2R, —NHCOOR, —SO_3R, —SR, and R,

wherein R is hydrogen, or a phenyl which is unsubstituted or further substituted with a substituent selected from lower alkyl, lower alkoxy, carboxy, sulfoxy, amino, mono-lower alkylamino, di-lower alkylamino, cyano, lower alkanoyloxy, amido, mono-alkylamido, dialkylamido, hydroxy, and halo, or R is an aliphatic selected from lower alkyl or lower alkenyl, each of which is unsubstituted or substituted by lower alkoxy, carboxy, sulfoxy, amino, mono-lower alkylamino, di-lower alkylamino, cyano, lower alkanoyloxy, amido, mono-lower alkylamido, di-lower alkylamido, hydroxy or halo, or R is a phenyl-lower alkyl which is unsubstituted or substituted by lower alkoxy, carboxy, sulfoxy, amino, mono-lower alkylamino, di-lower alkylamino, cyano, lower alkanoyloxy, amido, mono-lower alkylamido, di-lower alkylamido, hydroxy or halo,

said aliphatic portion of said alpha-(carbocyclic or heterocyclic) aromatic-aliphatic halide being lower alkyl which is unsubstituted or further substituted by lower alkoxy, carboxy, sulfoxy, amino, mono-lower alkylamino, di-lower alkylamino, cyano, lower alkanoyloxy, amido, mono-lower alkylamido, di-lower alkylamido, hydroxy or halo, and when said compound is polynuclear, the analogs thereof having at least one but not all of the nuclear rings partially or totally saturated, comprising:

reacting said compound with a stoichiometric excess of a hypophosphite salt in the presence of a catalytic amount of a hydrogenation catalyst in an aqueous, aqueous/organic, or liquid alkanoic acid medium at a temperature between 0° C. and the boiling point of the medium in the presence of a stoichiometric excess of a base.

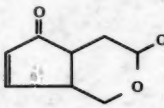
4,618,687

CYCLOPENTENONE COMPOUND AND PROCESS FOR PRODUCTION THEREOF

Tadashi Hirata, Yokohama; Hiromitsu Saito, Sagamihara, and Makoto Morimoto, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,549
Claims priority, application Japan, Apr. 23, 1984, 59-81500
Int. Cl.[4] C07D 311/94
U.S. Cl. 549—396 1 Claim

1. A cyclopentenone compound represented by the following formula:



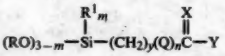
4,618,688

SILANE COMPOSITIONS

Ralph J. DePasquale; James M. Evans, both of Jacksonville, and Paul W. Kremer, Gainesville, all of Fla., assignors to SCM Corporation, New York, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,324
Int. Cl.[4] C07F 7/10, 7/18
U.S. Cl. 556—419 22 Claims

1. A silane having the general formula:



wherein R and R^1 are independently selected from alkyl groups containing from 1 to 3 carbon atoms; X is selected from (a) chalcogens, (b) NCH_2CH_2Y, where Y is N-saturated or N-unsaturated C_1–C_{20} alkyl or cycloalkyl, (c) N—C_6H_4-ortho-Y where Y is S; Q is CH_2S; and, when X is chalcogen, Y is selected from NH—$CH_2CH_2CH_2N(CH_3)_2$, and $NHNH_2$; m is zero to 3, y is 1 to 3, and n is zero to 1.

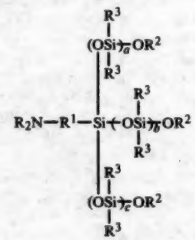
4,618,689

NOVEL AMINOFUNCTIONAL SILICONE COMPOSITIONS

Frank J. Traver, Troy, and Edward T. Simoneau, Greenwich, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Jul. 18, 1985, Ser. No. 756,481
Int. Cl.[4] C07F 7/10
U.S. Cl. 556—425 19 Claims

1. A composition having the general formula



wherein each R is independently selected from hydrogen, substituted and unsubstituted organic radicals, and radicals of the formula $—R^1NR_2$, where R is as previously defined; R^1 is a divalent organic radical; each R^2 is independently selected from substituted and unsubstituted alkyl radicals having at least 14 carbon atoms; each R^3 is an independently selected organic radical having from 1 to 13 carbon atoms; and a, b and c are, independently, 0 or a positive integer.

4,618,690

PROCESS FOR THE PREPARATION OF (1S, 4R)-4-HYDROXY-2-CYCLOPENTENYL ESTERS

Manfred Schneider, Wuppertal, and Kürt Laüimen, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 15, 1985, Ser. No. 734,421
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420510; Oct. 30, 1984, 3439598
Int. Cl.[4] C07F 7/08, 7/18, 7/04
U.S. Cl. 556—441 4 Claims

1. A 4-trialkylsilyloxy-2-cyclopentenyl ester of the formula

in which the alkyl radical contains 1–5 l carbon atoms and is optionally phenyl substituted, and Ac is an aliphatic acyl radical having 1 to 18 carbon atoms.

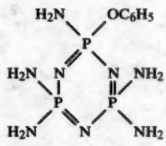
4,618,691

CYCLOTRIPHOSPHAZATRIENE-DERIVATIVES

Ramiro Medina, Sheffield, and Jack M. Sullivan, Florence, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 625,424, Jun. 28, 1984, now Defensive Publication No. T105,605. This application Dec. 31, 1984, Ser. No. 688,101
Int. Cl.[4] C07F 9/22; C12P 3/00
U.S. Cl. 558—80 4 Claims

1. A composition of matter eminently suitable for substantially sustaining the control of enzymatic decomposition of urea in soil systems, said enzymatic decomposition of said urea being to ammonia and carbonic acid and being due to the action of the enzyme urease thereupon, said new composition of matter having the formula:



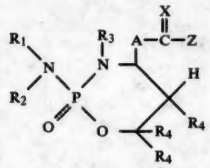
4,618,692

4-CARBAMOYLOXY-OXAZAPHOSPHORINS

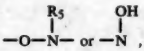
Gerhard Scheffler; Ulf Niemeyer; Norbert Brock, all of Bielefeld, and Jörg Pohl, Halle, all of Fed. Rep. of Germany, assignors to Asta-Werke Aktiengesellschaft, Bielefeld, Fed. Rep. of Germany

Continuation of Ser. No. 299,006, Sep. 3, 1981, abandoned. This application Feb. 13, 1984, Ser. No. 579,570
Int. Cl.[4] C07F 9/24, 9/65
U.S. Cl. 558—81 10 Claims

1. A 4-ureido-oxazaphosphorin of the general formula I



in which A is the group



Z is the group

or the group —OR_7; X is oxygen or sulphur; R_1 is 2-chloroethyl or 2-methanesulphonyloxyethyl; R_2 is hydrogen, methyl, ethyl or 2-chloroethyl; R_3 is hydrogen, methyl, ethyl, 2-chloroethyl or 2-methanesulphonyloxyethyl; R_4 is hydrogen or methyl; R_5 is hydrogen or C_{1-4}-alkyl; R_6 is hydrogen or C_{1-4}-alkyl; R_7 when in the secondary amino group is hydrogen, hydroxy, the carbamoyl group, C_{1-4}-alkyl, allyl, cyclohexyl, phenyl (optionally substituted by one or two of halogen, C_{1-4}-alkyl, C_{1-4}-alkoxy, trifluoromethyl, nitro or sulfamoyl), benzyl, naphthyl, fluorenyl, 9-oxofluorenyl, benzoyl, C_{1-4}-alkyl substituted by 1 to 3 substituents which may be the same or different and are selected from the group consisting of hydroxy, halogen, —COOH, —$COOR_8$, phenyl, benzyloxycarbonyl, and —$PO(CH_3)_2$, in which R_8 is methyl or ethyl; the total group

representing the morpholino ring or a saturated heterocyclic ring having from 4 to 6 carbon atoms and a nitrogen atom; R_7 when in the ether group is a C_{1-4}-alkyl possibly substituted by phenyl; and the pharmaceutically useful salts thereof.

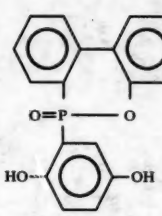
4,618,693

CYCLIC ORGANIC PHOSPHORUS COMPOUND AND PROCESS FOR PRODUCING SAME

Toranosuke Saito, Ibara; Masakatu Kitani, Kobe, and Hiroyuki Ohishi, Ibara, all of Japan, assignors to Sanko Kaihatsu Kagaku Kenkyusho, Osaka, Japan

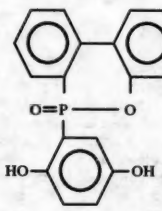
Filed Dec. 10, 1984, Ser. No. 679,720
Claims priority, application Japan, Dec. 9, 1983, 58-231503
Int. Cl.[4] C07F *9/32*
U.S. Cl. 558—82 **2 Claims**

1. A cyclic organic phosphorus compound expressed by the formula (I)



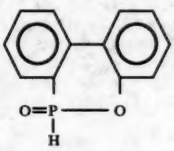
(I)

2. A process for producing a cyclic organic phosphorus compound expressed by the formula (I)



(I)

which process comprises reacting a compound expressed by the formula (II)



(II)

with 1,4-benzoquinone in the absence of a catalyst and wherein said compound expressed by the formula (II) is reacted with 1,4-benzoquinone while a state is kept wherein the former compound is always present in an inert solvent in excess of an equivalent amount to that of the latter compound.

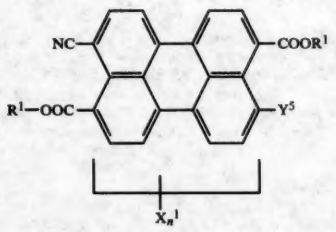
4,618,694

PERYLENE COMPOUNDS

Rüdiger Iden, Speyer, and Günther Seybold, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Jan. 11, 1985, Ser. No. 690,524
Int. Cl.[4] C07C *121/64*
U.S. Cl. 558—416 **6 Claims**

1. A perylene compound of the formula



where

Y^5 is halogen or cyano,
R^1 is hydrogen, straight-chain or branched C_1–C_{18}-alkyl or C_5–C_{18}-cycloalkyl-substituted C_1- or C_2-alkyl or is C_7–C_{18}-cycloalkyl, and the cycloalkyl radicals can contain from 1 to 4 rings,
X^1 is chlorine or bromine and
n is 0, 1 or 2.

4,618,695

METHOD OF PREPARING METHYL ESTER AND ITS HYDROCHLORIDE

Yoichi Ozawa, Yokohama; Shinichi Kishimoto, Yokkaichi; Emiko Shinohara, Saga; Tadashi Takemoto, Kawasaki, and Chikahiko Eguchi, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed May 17, 1984, Ser. No. 611,548
Claims priority, application Japan, Jun. 2, 1983, 58-98716; Jun. 3, 1983, 58-99038
Int. Cl.[4] C07C *101/02*
U.S. Cl. 560—41 **4 Claims**

1. A method of preparing an α-L-aspartyl-L-phenylalanine β-lower alkyl ester comprising reacting an N-carboxy anhydride of L-aspartic acid β-lower alkyl ester with L-phenylalanine in an aqueous solvent at a pH of from about 9.5 to about 11, followed by decarboxylation of the resultant N-carboxy-α-L-aspartyl-L-phenylalanine β-lower alkyl ester by acidifying said resultant ester with a mineral acid, wherein said lower alkyl ester is a methyl ester, ethyl ester or propyl ester.

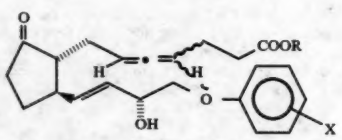
4,618,696

9-OXO-15α-HYDROXY-16-PHENOXY AND 16-SUBSTITUTED PHENOXY 17,18,19,20-TETRANORPROSTA-4,5,13,(E)-TRIENOATES

Gary F. Cooper, Menlo Park; John A. Edwards, Los Altos, both of Calif., and Albert R. Van Horn, Boulder, Colo., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 31, 1984, Ser. No. 636,058
Int. Cl.[4] C07C *177/00*
U.S. Cl. 560—53 **8 Claims**

1. A compound of the formula



or a racemic mixture thereof wherein R is hydrogen, lower alkyl or a pharmaceutically acceptable, non-toxic salt of a compound wherein R is hydrogen; X is hydrogen, halo, trifluoromethyl, lower alkyl or lower alkoxy; and the wavy lines represent the α or β configuration with the proviso that when one wavy line is α the other is β.

4,618,697

PROCESS FOR PREPARING ALPHA-ARYLALKANOIC ACIDS

Graziano Castaldi, Briona, and Claudio Giordano, Vicenza, both of Italy, assignors to Zambon SpA, Vicenza, Italy

Continuation-in-part of Ser. No. 520,131, Aug. 3, 1983, Pat. No. 4,535,166. This application Feb. 3, 1984, Ser. No. 576,711
Claims priority, application Italy, Mar. 7, 1983, 19930 A/83
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—56 **8 Claims**

1. A process for the preparation of alpha-arylalkanoic acids which comprises the rearrangement of an alpha-chloro- (or bromo)-alkyl-arylketal in neutral or slightly alkaline conditions in the presence of a dipolar aprotic diluent selected from dimethylformamide, dimethylsulphoxide, hexamethylfosforotriamide, N-methyl-pyrrolidone, dimethylacetamide, N-methyl-morpholine, O-alkylated polyglicols, sulpholane and mixtures thereof, and of a protic substance having a high dielectric constant selected from water, urea, thiourea, formamide, acetamide, N-methyl-formamide, N-methyl-acetamide, N,N'-dimethyl-urea and mixtures thereof, and the subsequent hydrolysis of the thus obtained ester.

4,618,698

PROCESS FOR THE PREPARATION OF A MIXTURE OF AN OPTIONALLY SUBSTITUTED CINNAMIC ACID ESTER AND AN OPTIONALLY SUBSTITUTED β-ALKOXY-β-PHENYL-PROPIONIC ACID ESTER, AND A PROCESS FOR THE PREPARATION OF OPTIONALLY SUBSTITUTED CINNAMIC ACID

Bernhard Beitzke, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,533
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1984, 3422412
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—060 **11 Claims**

1. A process for the preparation of a mixture of an optionally substituted cinnamic acid ester and an optionally substituted β-alkoxy-β-phenyl-propionic acid ester which comprises contacting an optionally substituted benzaldehyde with a molar excess of an optionally substituted acetic acid ester and with an alcoholate in the presence of an alcohol.

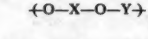
4,618,699

PHTHALIC ACID LOW MOLECULAR WEIGHT POLYESTERS AND PROCESS FOR PREPARING THE SAME

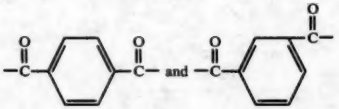
Peter Fialla, Wiener Neudorf, Austria, assignor to Isovolta Oesterreichische Isolierstoffwerke AG, Wiener Neudorf, Austria

Filed Jun. 1, 1984, Ser. No. 616,406
Claims priority, application Austria, Jun. 3, 1983, 2031/83
Int. Cl.[4] C07C *67/14, 69/80, 69/82*
U.S. Cl. 560—86 **14 Claims**

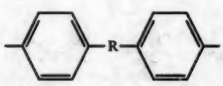
1. A low molecular weight polyester consisting essentially of chain members of the formula



wherein X is at least one member of the group consisting of



Y is



and R is selected from the group consisting of a bifunctional aliphatic hydrocarbon optionally containing at least one cycloaliphatic ring and a bifunctional hydrocarbon containing at least one aromatic ring, said polyester having an inherent viscosity of 0.08 to 0.35 dl/g measured at 30° C. on a 100 ml solution of 0.5 g of polyester in a solvent of 60% by weight of phenol and 40% by weight of 1,1,2,2-tetrachloroethane.

4,618,700

PROCESS FOR THE PREPARATION OF A HYDROXYPHENYLCARBOXYLATE

Erich Gubler, Birsfelden, and Max Siegrist, Lausen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 12, 1984, Ser. No. 680,687

Claims priority, application Switzerland, Dec. 22, 1983, 6858/83

Int. Cl.[4] C07C *69/88*

U.S. Cl. 560—67 8 Claims

1. A process for the preparation of pentaerythrityl tetrakis-[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate] by transesterifying a lower alkyl 3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate with pentaerythritol, in the presence of a catalytic amount of a basic catalyst, which process comprises carrying out the transesterification with a 15 to 50% excess of lower alkyl 3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate over the stoichiometric amount of 4 moles per 1 mole of pentaerythritol.

4,618,701

PROCESS FOR PREPARING 6-ACETOXY-2-NAPHTHOIC-ACID AND PURE 6-HYDROXY-2-NAPHTHOIC ACID

Rudolf Neeb, Offenbach am Main; Wolfgang Ironich, Eppstein/Taunus, and Heinrich Volk, Bad Vilbel, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 26, 1985, Ser. No. 705,626

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1984, 3407100

Int. Cl.[4] C07C *67/08, 69/145*

U.S. Cl. 560—139 24 Claims

1. A process for preparing 6-acetoxy-2-naphthoic acid which comprises reacting an alkali metal salt of 6-hydroxy-2-naphthoic acid in aqueous alkaline solution with acetic anhydride at a pH of at least 10 and at a temperature below 50° C., with the use of 1 to 3.5 moles of acetic anhydride per mole of 6-hydroxy-2-naphthoic acid.

4,618,702

MANUFACTURE OF BUTANEDICARBOXYLIC ACID ESTERS

Michael B. D'Amore, and Roger R. Ellefson, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 24, 1985, Ser. No. 694,679

Int. Cl.[4] C07C *67/38*

U.S. Cl. 560—204 7 Claims

1. In a process for the carboalkoxylation of butadiene by reacting in a first step butadiene, carbon monoxide and at least one lower alkyl alcohol which process comprises introducing at least about 0.15 mole of a cobalt-containing catalyst based upon cobalt and at least 0.5 mole of nitrogen base per mole of butadiene along with carbon monoxide, alcohol and butadiene into a reactor and thereafter reacting the butadiene at elevated temperature and pressure to form an alkylpentenoate, followed by a second step comprising the carboalkoxylation of the alkylpentenoate to a dialkyladipate at an increased temperature relative to the first step and wherein essentially no components are removed from the reaction product between the first and second steps.

4,618,703

PRODUCTION OF THE ACRYLATES AND METHACRYLATES OF OXYALKYLATED ALLYL ALCOHOL

Chandrakant B. Thanawalla, Exton, and David C. Dehm, Thornton, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 13, 1985, Ser. No. 775,898

Int. Cl.[4] C07C *67/26*

U.S. Cl. 560—209 14 Claims

1. A radiation-crosslinkable diluent for radiation-hardenable compositions comprising the acrylates or halo-substituted derivatives thereof of the reaction product of allyl alcohol with from about 1 to about 20 moles of an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide and mixtures thereof.

4,618,704

ACYLOXY-2-BUTENES AND THEIR PREPARATION

Hans-Martin Weitz, Bad Durkheim, and Rolf Fischer, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

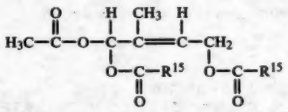
Filed Apr. 3, 1979, Ser. No. 26,737

Claims priority, application Fed. Rep. of Germany, May 5, 1978, 2819592

Int. Cl.[4] C07C *67/055, 69/10, 69/18, 69/30*

U.S. Cl. 560—262 3 Claims

1. 1,1,4-Triacyloxy-2-methyl-2-butenes of the formula



III

where R^{15} is hydrogen, methyl or ethyl.

4,618,705

PROCESS FOR CONVERSION OF ACID ANHYDRIDES TO ALKYLIDENE DIESTERS

Nabil Rizkalla, River Vale, N.J., assignor to The Halcon SD Group, Inc., Montvale, N.J.

Continuation of Ser. No. 171,064, Jul. 22, 1980, abandoned. This application Jan. 22, 1982, Ser. No. 341,977

Int. Cl.[4] C07C *67/00, 69/003, 69/007, 69/16*

U.S. Cl. 560—263 5 Claims

1. A process for the preparation of an alkylidene diester from a carboxylic acid anhydride, which comprises reacting said carboxylic acid anhydride with hydrogen in the presence of a cobalt carbonyl, said reacting being carried out at a temperature below 100° C., whereby decomposition of said cobalt carbonyl is minimized and said alkylidene diester is produced with minimum formation of aldehydes and like by-products, and recovering the thus-produced alkylidene diester from the resulting substantially aldehyde-free reaction mixture.

4,618,706

PROCESS FOR THE PREPARATION OF AROMATIC POLYISOCYANATES CONTAINING UREA AND/OR BIURET GROUPS

Hans-Joachim Scholl, and Hans Hettel, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 2, 1982, Ser. No. 364,945

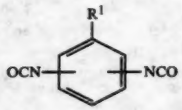
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114638

Int. Cl.[4] C07C *127/24*

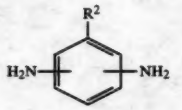
U.S. Cl. 560—335 4 Claims

1. A process for the preparation of aromatic polyisocyanates containing urea and/or biuret groups, optionally in the form of a mixture of homologues and/or isomers, which comprises reacting diisocyanates which are free from urea and biuret groups selected from the group consisting of aromatic diisocy-

anates with diamines having primary or secondary amino groups and which are free from urea and biuret groups at about 20° to 180° C., and at an equivalent ratio of isocyanate groups to amino groups in the range of about 5:1 to 100:1 without precipitating any insoluble urea and/or biuret constituents, wherein at least about 25 mol % of the diisocyanates put into the process correspond to the formula:



and/or at least about 25 mol % of the diamines put into the process correspond to the formula:



wherein

R^1 represents a saturated aliphatic hydrocarbon having 6 to 18 carbon atoms and

R^2 represents a saturated aliphatic hydrocarbon having 10 to 13 carbon atoms.

4,618,707

PREPARATION OF MENTHANE DIISOCYANATE BY ADDITION OF ISOCYANIC ACID TO TERPINYL MONOISOCYANATES

Robert A. Grimm, Columbus; Jai H. Kyung, Dublin; Phyllis L. Brusky; Joseph G. Holehouse, both of Columbus, and Biauhung Chang, Worthington, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Nov. 25, 1985, Ser. No. 801,443

Int. Cl.[4] C07C *71/00*

U.S. Cl. 560—337 **7 Claims**

1. The process for preparing menthane diisocyanate consisting essentially of reacting a terpinyl monoisocyanate with isocyanic acid at a pressure in the range of from about atmospheric to about 2000 psi in a medium which is selected from the group consisting of a nitrohydrocarbon, an organic carbonate, and a mixture of an organic carbonate with toluene, benzene, xylene or chlorobenzene in the presence of a catalyst which is at least one member selected from the group consisting of a perfluorinated sulfonic acid, boron trifluoride, boron trifluoride etherate, toluene sulfonic acid, benzene sulfonic acid, camphor sulfonic acid, naphthalene sulfonic acid, methane sulfonic acid, aluminum chloride, and iodine.

4,618,708

AMINO ACID DERIVATIVE

Bernard Roques, 12 Rue E. Delacroix, 94410 St. Maurice; Jean-Charles Schwartz, 9, Villa Seurat, 75014 Paris, and Jeanne-Marie Lecomte, 30 Rue des Francs-Bourgeois, 75003 Paris, all of France

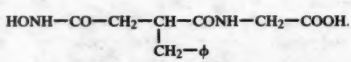
Continuation of Ser. No. 449,687, Dec. 14, 1982, abandoned. This application Mar. 25, 1985, Ser. No. 715,764

Claims priority, application France, Dec. 16, 1981, 81 23488

Int. Cl.[4] C07C *101/24, 103/52*

U.S. Cl. 562—448 **1 Claim**

1.



4,618,709

WASTE WATER TREATMENT IN THE PRODUCTION OF METHACRYLIC ACID

Masao Sada, Nara; Michio Kato, Ehime; Masami Ayano, Ehime; Tadashi Abe, Ehime, and Masanori Moriwaki, Ehime, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 30, 1981, Ser. No. 229,844

Claims priority, application Japan, Feb. 1, 1980, 55-11622

Int. Cl.[4] C07C *51/25, 51/48, 57/05, 57/055*

U.S. Cl. 562—532 **9 Claims**

1. A process for separation of methacrylic acid from a methacrylic acid-containing gaseous reaction mixture, comprising the steps of:

(a) cooling a gaseous reaction mixture, which has been obtained by subjecting methacrolein or a compound which can produce methacrolein under reaction conditions and molecular oxygen to a gas phase oxidation reaction in the presence of an oxidation catalyst in the presence of an inert non-condensable dilution gas or a mixture thereof with water vapor in a concentration of less than 20 mol %, to separate said gaseous reaction mixture into condensable components including methacrylic acid, acetic acid and water as a condensed liquor and non-condensable components including methacrolein as a non-condensed gaseous mixture;

(b) separating contaminating methacrolein from the condensed liquor to form a condensed liquor and an exhaust gas;

(c) recycling exhaust gas from step (b) for use as said inert non-condensable dilution gas;

(d) contacting the condensed liquor with an organic solvent to extract methacrylic acid, followed by separation into an organic solvent solution including methacrylic acid and a waste water solution;

(e) evaporating the waste water solution; and

(f) subjecting the waste water vapor to catalytic combustion with molecular oxygen.

4,618,710

PREPARATION OF OPTICALLY ACTIVE KETONES

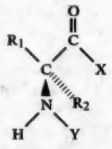
Henry Rapoport, Berkeley, and Thomas F. Buckley, III, Albany, both of Calif., assignors to The Regents of the University of Calif., Berkeley, Calif.

Division of Ser. No. 262,972, May 12, 1981, abandoned. This application Sep. 13, 1982, Ser. No. 417,771

Int. Cl.[4] C07C *125/065, 125/067, 143/74, 143/78*

U.S. Cl. 564—1 **8 Claims**

1. A method of preparing an alpha-amino alkyl organic ketone having an asymmetric alpha carbon atom, comprising reacting a compound having an asymmetric alpha carbon atom, said compound having the formula:



wherein X is OH, Cl, Br, or $OCOR_3$;

Y is a radical selected to stabilize the alpha carbon atom of the alpha-amino acid derivative sufficiently to prevent significant change in symmetry thereof during replace-

ment of X with an alkyl, aryl, alkenyl, alkynyl, alkarly, aralkyl, alkenaryl or alkynaryl radical, or such radical having one or more chemical constituents thereon, Y being selected from

$-SO_2R_4$; $-SeO_2R_4$; $-TeO_2R_4$; $-PO_3R_4$;

$$-AsO_3R_4 \text{ or } -\overset{O}{\overset{\|}{C}}-O-R_5$$

wherein R_4 is hydrogen, an alkyl, aryl, alkenyl, alkynyl, alkaryl, aralkyl, alkenaryl, alkynaryl radical, or such radical having one or more non-protic chemical constituents thereon, or is one or more non-protic chemical constituent; and R_5 is an alkyl, aryl, alkenyl, alkynyl, alkaryl, aralkyl, alkenaryl or alkynaryl radical, or such radical having one or more non-protic chemical constituent;

R_1 and R_2 are different from one another and are each hydrogen or an alkyl, aryl, alkenyl, alkynyl, alkaryl, aralkyl, alkenaryl, or alkynaryl radical, or such radical having one or more non-protic chemical constituents thereon; and R_3 is hydrogen, or an alkyl, aryl, alkenyl, alkynyl, alkaryl, aralkyl, alkenaryl, or alkynaryl radical or such a radical having one or more chemical constituents thereon; with a reagent capable of converting the

$$\overset{O}{\overset{\|}{C}}-X$$

portion of said compound to said ketone, either said reacting being via a Friedel-Crafts reaction and said reagent being aromatic or said reacting being via an organometallic reaction and said reagent being an organometallic reagent, said ketone substantially retaining the stereospecificity of said compound at said alpha carbon atom.

4,618,711

ANTI-ARRHYTHMIC AGENTS

George C. Buzby, Jr., Blue Bell, Pa., assignor to American Home Products Corporation, New York, N.Y.

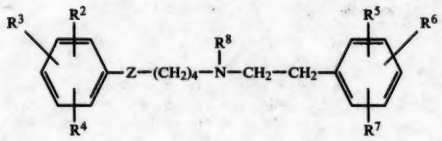
Filed Mar. 29, 1985, Ser. No. 717,341

The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.

Int. Cl.[4] **C07C** *143/80, 143/78, 143/822*

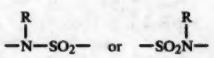
U.S. Cl. 564—86 **2 Claims**

1. A compound of the formula:



in which

Z is



where R is hydrogen, alkyl of 1–6 carbon atoms, polyfluorinated alkyl of 1 to 6 carbon atoms, —CN, cyanoalkyl in which the alkyl moiety contains 1 to 3 carbon atoms, cycloalkyl of 3 to 6 carbon atoms or cycloalkylalkyl of 4 to 8 carbon atoms;

R^2, R^3, R^4, R^5, R^6 and R^7, independently, are hydrogen, alkoxy of 1–3 carbon atoms, trifluoromethyl, —Cl, —Br or —F;

R^8 is hydrogen or alkyl of 1 to 6 carbon atoms;

or a pharmaceutically acceptable salt thereof.

4,618,712

N-CYANOCARBOXYLIC ACID AMIDES, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Friedrich Stockinger, Hölstein; Friedrich Lohse, Oberwil, and Roland Moser, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 15, 1983, Ser. No. 466,457

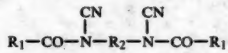
Claims priority, application Switzerland, Feb. 23, 1982, 1107/82

Int. Cl.[4] **C07L** *125/08;* **C08G** *59/44*

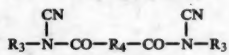
U.S. Cl. 564—103 **3 Claims**

1. An M-cyanocarboxylic acid amide derivative which contains two or three

groupings in the molecule, of one of the formulae I to III

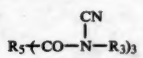


(I)



(II)

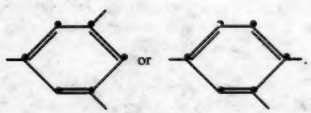
and



(III)

in which R_1 is unsubstituted or substituted alkyl having 1 to 8 carbon atoms, cycloalkyl having 5 to 8 carbon atoms or unsubstituted or substituted aryl having 6 or 10 ring carbon atoms, R_2 is alkylene having 2 to 12 carbon atoms, which may be interrupted by O or S atoms, but-2-enylene, but-2-ynylene, phenylenedimethylene or a radical of the formula

in which —A— is $—CH_2—$, $—SO_2—$ or —O—, R_3 is unsubstituted or substituted alkyl having 1 to 8 carbon atoms, unsubstituted or substituted phenyl or aralkyl having not more than 12 carbon atoms, cycloalkyl having 5 to 8 carbon atoms, allyl or methallyl, R_4 is a direct bond, alkylene having 1 to 12 carbon atoms which may be interrupted by O or S atoms, 1,3- or 1,4-cyclohexylene or 1,3- or 1,4-phenylene and R_5 is a radical of the formula



4,618,713

PREPARATION OF 2'-METHYL-2-HALOACETANILIDES

John P. Chupp, Kirkwood, and Michael J. Miller, Manchester, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sep. 7, 1983, Ser. No. 530,154
Int. Cl.[4] C07C *102/00, 103/34, 149/42*
U.S. Cl. 564—214 13 Claims

1. A process for preparing a 2'-methyl-2-haloacetanilide which comprises reacting a 2'-(halomethyl)-2-haloacetanilide with hydrogen in the presence of an acid scavenger and hydrogenation catalyst, whereby said 2'-(halomethyl)-2-haloacetanilide is selectively hydrogenated to 2'-methyl-2-haloacetanilide.

2. A process for preparing a 2'-methyl-2-haloacetanilide comprising:

(a) reacting an ortho-(halomethyl) aniline or its anilinium salt with a haloacetyl halide in the presence of an inert solvent to produce a 2'-(halomethyl)-2-haloacetanilide; and

(b) thereafter reacting the 2'-(halomethyl)-2-haloacetanilide with hydrogen in the presence of an acid scavenger and hydrogenation catalyst, whereby said 2'-(halomethyl)-2-haloacetanilide is selectively hydrogenated to a 2'-methyl-2-haloacetanilide.

4,618,714

PROCESS FOR PREPARATION OF 3,3'- OR 3,4'-DIAMINOBENZOPHENONES

Keizaburo Yamaguchi, Kanagawa; Kenichi Sugimoto, Tokyo; Yoshimitsu Tanabe, Kanagawa; Saburo Kawashima, Kanagawa, and Akihiro Yamaguchi, Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed May 2, 1983, Ser. No. 490,546
Claims priority, application Japan, Mar. 23, 1983, 58-47097
Int. Cl.[4] C07C *97/10*
U.S. Cl. 564—329 5 Claims

1. A process for the preparation of 3,3'- or 3,4'-diaminobenzophenone, which comprises nitrating a chloronitrobenzophenone mixture obtained by the Friedel-Crafts reaction between 3- or 4-nitrobenzoyl chloride and chlorobenzene and then catalytically reducing and dechlorinating the resulting chlorodinitrobenzophenone mixture in the presence of a reduction catalyst and a dehydrochlorinating agent.

4,618,715

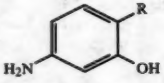
PRODUCTION OF OXYGEN AND NITROGEN SUBSTITUTED BENZENES

Stephen C. Eyley, and Stephen C. W. Coltman, both of Loughborough, England, assignors to Fisons Limited, Ipswitch, England

Filed Nov. 2, 1981, Ser. No. 317,138
Claims priority, application United Kingdom, Nov. 15, 1980, 8036737
Int. Cl.[4] C07C *85/20, 85/153*
U.S. Cl. 564—414 10 Claims

1. A process for the production of 3-amino-4,6-diacetyl phenol, or a derivative thereof, which comprises reacting a compound of formula III,

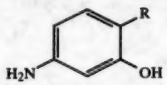
III



or a protected derivative thereof, in which R is acetyl or hydrogen, with an excess of acetyl chloride or acetyl bromide and aluminium chloride or aluminium bromide at a temperature of from 30° to 50° C. in an halogenated hydrocarbon solvent.

10. A process for the production of 3-amino-4,6-diacetyl phenol, or a derivative thereof, which comprises reacting a compound of formula III,

III



or a protected derivative thereof,

in which R is acetyl or hydrogen, with at least five equivalents of acetyl chloride or acetyl bromide and with at least five equivalents or aluminium chloride or aluminium bromide at a temperature of from 30° to 50° C. in an halogenated hydrocarbon solvent.

4,618,716

PREPARATION OF POLYETHYLENE POLYAMINES FROM 2-AMINOETHYL SULFURIC ACID

Michael E. Ford, Center Valley, and Thomas A. Johnson, Orefield, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 8, 1985, Ser. No. 796,472
Int. Cl.[4] C07C *85/02*
U.S. Cl. 564—469 8 Claims

1. In a process for producing polyethylene polyamines utilizing 2-aminoethyl sulfuric acid as a reactant, the improvement for enhancing the production of polyethylene polyamines with high selectivity to linear polyethylene polyamines which comprises:

reacting ammonia or an ethyleneamine with 2-aminoethyl sulfuric acid under conditions sufficient to form a higher polyethylene polyamine salt,

neutralizing the higher polyethylene polyamine salt under conditions for forming the free amine; and

recovering said free higher polyethylene polyamine.

4,618,717

CATALYTIC PROCESS FOR THE PRODUCTION OF PRIMARY AMINES FROM OXYETHYLENE GLYCOL MONOALKYL ETHERS

Terry L. Renken, and John F. Knifton, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 17, 1984, Ser. No. 651,372
Int. Cl.[4] C07C *89/02*
U.S. Cl. 564—475 8 Claims

1. A process for the conversion of an oxyalkylene glycol monoalkyl ether to the corresponding primary amine, said monoalkyl ether having the formula:

$$[R(OCH_2CH_2)OH]\ R(OCH_2CH_2)_xOH \quad (I)$$

wherein R is an alkyl group containig 1 to 10 carbon atoms and x is an integer having a value of about 1 to about 5,

said catalyst containing, as the active components, from about 50 to about 90 wt. % of nickel, about 10 to about 50 wt. % of copper and about 0.5 about 5 wt. % of an oxide selected from the class consisting of chromium oxide, iron oxide, titanium oxide, thorium oxide, zirconium oxide, manganese oxide, magnesium oxide and zinc oxide,

said monoalkyl ether being brought into contact with said catalyst under liquid phase conversion conditions effective for the conversion of about 40% to about 80% of said monoalkyl ether including a temperature within the range of about 175° to about 250° C., and a pressure within the range of about 500 to about 5000 psig, said conversion being conducted in the presence of added hydrogen and added ammonia utilized in the proportions of about 0.3 to about 0.7 mole of hydrogen and about 4 to about 25 moles of ammonia per mole of said monoalkyl ether, the partial pressure of said hydrogen being less than 30%, whereby said monoalkyl ether is substantially selectively converted

to the corresponding primary amine, and recovering said primary amine from the products of said reaction.

4,618,718

PREPARATION OF TRIFLUOROETHYLAMINE

Arthur J. Elliott, Sloatsburg, N.Y., and Gary W. Astrologes, Hackensack, N.J., assignors to Halocarbon Products Corporation, Hackensack, N.J.

Filed Jun. 14, 1985, Ser. No. 745,058
Int. Cl.[4] C07C *85/04*
U.S. Cl. 564—481 **7 Claims**

1. In the reaction of a 2,2,2-trifluoroethyl halide with ammonia to produce 2,2,2-trifluoroethylamine, the improvement which comprises effecting the reaction with from about 1 to 3 moles of ammonia per mole of the trifluoroethyl halide at a temperature of about 170° to 240° C. and a pressure less than about 300 psig in the presence of a substantially anhydrous inert solvent present in at least about the same molar amount as the trifluoroethyl halide.

4,618,719

ADDITION OF PHOSPHINES TO ALPHA-OLEFINS

W. Elliot Bay, Ridgefield, Conn., and Karl E. Reineke, Mohegan Lake, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 4, 1985, Ser. No. 707,714
Int. Cl.[4] C07F *9/50*
U.S. Cl. 568—17 **12 Claims**

1. A process for addition-reacting a phosphine first reactant with an alpha olefin second reactant by mixing said first reactant and said second reactant and heating said mixture in the absence of an initiator or catalyst at a temperature of at least 200° C. for a time and at a pressure sufficient to effect a yield of at least 50% of an alkyl diphenyl phosphine product.

4,618,720

PREPARATION OF ALKYLDIARYLPHOSPHINES

W. Elliott Bay, Ridgefield, Conn.; Karl E. Reineke, Mohegan Lake, and Edward D. Weil, Hastings-on-Hudson, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 4, 1985, Ser. No. 707,713
Int. Cl.[4] C07F *9/50*
U.S. Cl. 568—17 **52 Claims**

1. An improved two-step process for preparing a compound C3 having the structural formula

wherein:
Z is phosphorus;
Y is aryl;
X is aryl;
W is a substituted or unsubstituted aryl, alkyl, arylalkyl, or alkylaryl radical or hydrogen; and
U is hydrogen or

or halogen; by a first step comprising converting a first diphenylphosphinous halide compound, C1, into a second compound, C2; and a second step comprising converting C2 into a third compound, C3; wherein the first step comprises reacting a first halide C1, with a molten alkali metal, M, or amalgam thereof, in the presence of an insert solvent, S, to form a first reacted mixture comprising C2; and the second step comprises reacting C2 with a second halide, W-"H2" or "H2"-W-"H2", to form a second reacted mixture comprising C3; all wherein

(i) C1 has a structural formula

wherein:
X,Y,Z are as defined above: and
"H1" is a halogen atom; and
(ii) C2 has a structural formula

wherein: X,Y,Z and M are as defined above:
(iii) "H2" is a halogen atom; and
(iv) W is as defined above; wherein the improvement comprises using an amount of M such that the first reacted mixture comprises an excess of M in an amount of less than 100%, and wherein the yield of C3 is greater than 70 percent, and wherein the second halide is added to the first reacted mixture in situ.

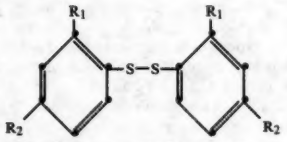
4,618,721

PROCESS FOR THE PREPARATION OF NITRODIPHENYL DISULFIDES

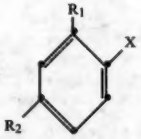
Vittore Sartori, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 21, 1985, Ser. No. 714,308
Claims priority, application Switzerland, Mar. 26, 1984, 1499/84
Int. Cl.[4] C07C *148/00*
U.S. Cl. 568—23 **10 Claims**

1. A process for the preparation of a nitrodiphenyl disulfide of the formula



by reacting a halonitrobenzene of the formula



in which formulae above X is chlorine, bromine or iodine, R_1 is hydrogen or nitro and R_2 is hydrogen, C_1–C_4 alkyl, halogen, nitro or sulfo, with the proviso that at least one of R_1 and R_2 is nitro, with an alkali disulfide, which process comprises carrying out the reaction in water with the addition of 2 to 30% by weight, based on halonitrobenzene, of a non-ionic surfactant selected from the group of adducts of ethylene oxide and alkylphenols, fatty alcohols, fatty amines or fatty acids, the molecular weight of these adducts being in the range from 300

to 10,000, or an anionic surfactant selected from the group of condensates of formaldehyde and aromatic sulfonic acids, alkylbenzimidazoledisulfonic acids containing 10 to 25 carbon atoms in the alkyl moiety, alkylphenol polyglycol ether sulfates or phosphates containing 5 to 15 carbon atoms in the alkyl moiety, fatty alcohol glycol ether sulfates, sulfonated or sulfated dicarboxylic acid esters or C_6–C_{20}-alkylbenzenesulfonates.

4,618,722

PREPARATION OF ORGANIC SULFIDES

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 701,705, Feb. 14, 1985, abandoned. This application Jun. 10, 1985, Ser. No. 742,677

Int. Cl.[4] C07C *149/10*

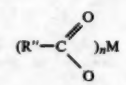
U.S. Cl. 568—59 **20 Claims**

1. A process for preparing dihydrocarbyl sulfides comprising the step of simultaneously contacting:

(a) a dialkyl sulfoxide of the formula

(b) a hydrocarbyl halide of the formula R'-X, and

(c) a metal carboxylate of the formula



under such conditions as will result in a reaction product comprising at least one alkyl hydrocarbyl sulfide of the formula R-S-R'; wherein the radicals R, which can be the same or different, are alkyl groups containing from 1 to 8 carbon atoms; R' is selected from the group consisting of alkyl groups containing from 1 to 25 carbon atoms, alkenyl groups containing from 3 to 25 carbon atoms and cycloalkyl groups containing from 5 to 25 carbon atoms; X is selected from the group consisting of Cl, Br and I; R'' is selected from the group consisting of H and alkyl groups having from 1 to 4 carbon atoms; n is 1 or 2; and M is a mono- or divalent cation of a metal selected from the group of metals belonging to Groups IA, IIA, IVA, IB, IIB VIIB and VIII of the Periodic Table.

4,618,723

REDUCTION OF CARBON OXIDES WITH HYDROGEN SULFIDE

Daniel R. Herrington, Bainbridge, and Philip L. Kuch, Aurora, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 10, 1982, Ser. No. 448,466

Int. Cl.[4] C07C *149/06, 1/04, 1/12, 29/15*

U.S. Cl. 568—70 **21 Claims**

1. A process of reducing carbon oxides with hydrogen sulfide, the method comprising:

(a) contacting at least one of carbon monoxide and carbon dioxide with hydrogen sulfide to form carbonyl sulfide,

(b) contacting the carbonyl sulfide produced in (a) with oxygen to form carbon monoxide and sulfur dioxide, and

(c) hydrogenating at least one of the carbon monoxide and carbonyl sulfide to an organic compound.

4,618,724

PERFLUOROCARBON POLYMER OXIDATION CATALYST AND PREPARATION OF CARBONYL COMPOUND

Hitosi Nozaki, Takatsuki, and Koichiro Oshima, Kyoto, both of Japan, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 11, 1985, Ser. No. 700,655

Claims priority, application Japan, Feb. 28, 1984, 59-35321

Int. Cl.[4] C07C *45/29*

U.S. Cl. 568—311 **3 Claims**

1. A method of oxidizing a secondary organic alcohol to form a ketone which comprises treating said alcohol with at least one oxidizing agent selected from the class consisting of tertiary butyl hydroperoxide, cumene hydroperoxide, benzoyl peroxide, and sodium bromate in the presence of a perfluorocarbon polymer consisting of a perfluorocarbon main chain and side chains containing terminal structural units of the formula

$$-CF_2SO_2X$$

wherein X is chromium (III) or cerium (IV) wherein the weight in grams of the perfluorocarbon polymer per one mole of $-CF_2SO_2X$ groups is between 900 and 3000, and wherein the polymer is present in catalytically effective amounts, for a time and temperature sufficient to produce said ketone.

4,618,725

PREPARATION OF α-METHYL-SUBSTITUTED KETONES

Hans-Heinrich Lenz, Mannheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

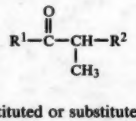
Filed Jun. 13, 1985, Ser. No. 744,225

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1984, 3422282

Int. Cl.[4] C07C *45/71*

U.S. Cl. 568—315 **6 Claims**

1. A process for producing α-methyl-substituted ketones of the formula



wherein R^1 is unsubstituted or substituted aryl or hetaryl or a tert.-alkyl radical, and R^2 is hydrogen or straight-chain or branched alkyl of 1 to 12 carbon atoms, or R^1 and R^2 together form an unsubstituted or substituted alkylene group $-(CH_2)_n-$, where n is an integer from 3 to 13, wherein the corresponding unsubstituted ketone, which must possess two or more geminal hydrogen atoms in the α-position, is reacted with methanol in the gase phase at from 350° to 500° C. and under from 1 to 20 bar in the presence of a magnesium oxide catalyst.

4,618,726

PROCESS FOR THE PREPARATION OF BENZOPHENONES

Michel Desbois, Rillieux, France, assignor to Rhone-Poulenc Specialites Chimiques, France

Filed Dec. 18, 1984, Ser. No. 683,171

Claims priority, application France, Dec. 22, 1983, 83 20537

Int. Cl.[4] C07C *45/47*

U.S. Cl. 568—322 **15 Claims**

1. A process for the preparation of benzophenones comprising the step of reacting a compound of the formula COX_4X_5 (I), where X_4 and X_5 are identical or different and each is a halogen atom. with a deactivated benzene derivative in liquid hydrofluoric acid and in the presence of boron trifluoride

(BF_3) in an amount sufficient that the absolute pressure of (BF_3) is at least 1 bar.

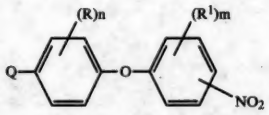
4,618,727

NITRO SUBSTITUTED DIPHENYL ETHERS

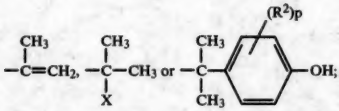
Shenghong A. Dai, Wallingford, Conn., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 5, 1984, Ser. No. 668,540
Int. Cl.[4] C07C *79/35*
U.S. Cl. 568—585 12 Claims

1. A nitro substituted diphenyl ether having the formula



wherein
Q is



R, R^1, and R^2 are independently selected from the group consisting of alkyl, aryl, aralkyl, and cycloalkyl;
X represents halogen; and n, m, and p each have an independent value of 0 to 4, inclusive.

4,618,728

WATER AIDED CATECHOL ETHERIFICATION

Philip B. Hobson, Trenton, and Robert E. Keay, Stockton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 22, 1985, Ser. No. 704,434
Int. Cl.[4] C07C *41/16*
U.S. Cl. 568—652 4 Claims

1. In a process for preparing 2-methallyloxyphenol by reacting catechol with methallyl chloride at a temperature in the range of 70° C. to 150° C. in the presence of one or more bases selected from the group consisting of alkali metal carbonates, alkali metal bicarbonates, alkaline earth carbonates, and alkaline earth bicarbonates, said reaction being conducted without an etherification catalyst in a solvent system consisting of water and an aliphatic ketone having 4 to 8 carbon atoms, using from 0.55 to 0.75 moles of methallyl chloride per mole of catechol, the improvement comprising using a molar ratio of 0.3 to 1.9 moles of water per mole of catechol and conducting the reaction for a period of 1 to 3 hours.

4,618,729

RUTHENIUM-COBALT CARBONYL METAL CLUSTER CATALYSTS FOR THE DEALKOXYHYDROXYMETHYLATION OF ACETALS TO FORM GLYCOL ETHERS

D. Michael Duggan, Drexel Hill; James E. Lyons, Wallingford, and Harry K. Myers, Jr., Cochranville, all of Pa., assignors to Sun Refining and Marketing Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 622,816, Jun. 21, 1984, abandoned. This application Oct. 2, 1985, Ser. No. 782,807
Int. Cl.[4] C07C *41/28, 41/18*
U.S. Cl. 568—678 16 Claims

1. Process for the dealkoxyhydroxymethylation of an aldehyde acetal of the formula

wherein R is hydrogen, alkyl, cycloalkyl, or aryl; r^1 and r^2, which may be same or different, are alkyl, cycloalkyl, or aryl, and wherein R^1 and R^2, taken together, may form a cyclic acetal, which comprises reacting said acetal, which has been formed separately or in situ, with syngas in the presence of a catalytically effective amount of a catalyst comprising the complex $Co_2Ru(CO)_{11}$ to form the corresponding glycol monoether.

4,618,730

PROCESS FOR THE PRODUCTION OF PYROCATECHOL AND HYDROQUINONE

Karlheinz Drauz, Freigericht, and Axel Kleemann, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 8, 1984, Ser. No. 587,652
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1983, 3308737
The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.
Int. Cl.[4] C07C *37/60, 39/10*
U.S. Cl. 568—771 32 Claims

1. A process for the production of pyrocatechol and hydroquinone by nuclear hydroxylation of phenol with hydrogen peroxide in a substantially water-free organic solvent in the presence of a catalyst comprising reacting phenol with hydrogen peroxide in a solution in substantially water-free organic solvent which solvent forms an azeotrope with water, the boiling point of the azeotrope being below the boiling point of hydrogen peroxide, based on normal pressure, said reaction being carried out in the presence of sulfur dioxide as a catalyst.

4,618,731

PROCESS FOR PURIFYING 2-PERFLUOROALKYLETHANOLS

Leonard H. Beck, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 20, 1985, Ser. No. 800,007
Int. Cl.[4] C07C *29/74, 29/88*
U.S. Cl. 568—842 5 Claims

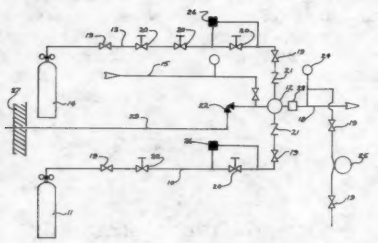
1. In a process wherein a perfluoroalkylethyl iodide or a mixture of perfluoroalkylethyl iodides is reacted with oleum, the resulting perfluoroalkylethyl hydrogen sulfate or mixture of said sulfates is hydrolyzed in an aqueous sulfuric acid medium, and a perfluoroalkylethanol or a mixture of such ethanols having the formula $R_fCH_2CH_2OH$ is recovered as a final product which contains unreacted iodides having the formulae $R_fCH_2CH_2I$ and R_fI in sufficient quantities so as to cause discoloration of $R_fCH_2CH_2OH$ or products made from it wherein R_f is a perfluoroalkyl radical or a mixture of said radicals containing 4 to 28 carbon atoms, the improvement consisting essentially of reacting said unreacted iodides with an excess of an aqueous alkali metal hydroxide and a C_1–C_3 alcohol in a closed vessel at a temperature above 80° C. until neither of said iodides can be detected in said final product.

4,618,732

DIRECT CONVERSION OF NATURAL GAS TO METHANOL BY CONTROLLED OXIDATION

Hyman D. Gesser, 218 Girton Ave., Winnipeg, Manitoba; Norman R. Hunter, Lot 68, Red River Drive, R.M. of Ritchot, Manitoba, and Lawrence Morton, 1018-110 Adamar Road, Winnipeg, Manitoba, all of Canada

Filed May 20, 1985, Ser. No. 735,983
Int. Cl.[4] C07C *29/48*
U.S. Cl. 568—910.5 13 Claims



1. A process for converting natural gas containing methane to methanol, comprising:

thoroughly and intimately mixing natural gas with gaseous air or oxygen to achieve substantially complete homogeneity of these gases;

feeding the resulting gas mixture to an inert reactor under elevated pressure, said inert reactor having an internal surface surrounding a zone in which said gases react, said surface being made of a material selected from the group consisting of glass, non-reactive plastics, non-reactive waxes and non-reactive salts; and

reacting said gases in said reaction zone at an elevated temperature in the absence in said reaction zone of any added material which measurably affects the rate of selectivity of the reaction or the yield of the product.

4,618,733

VAPOR PHASE NITRATION OF AROMATIC COMPOUNDS

Ignatius Schumacher, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 14, 1984, Ser. No. 671,253
Int. Cl.[4] C07C *79/10;* C07B *43/02*
U.S. Cl. 568—927 25 Claims

1. In a process for the vapor phase nitration of aromatic compounds where an aromatic compound-containing feed mixture is contacted with a nitrating agent in the vapor phase to produce the corresponding nitroaromatic compound, the improvement comprising conducting the nitration in the presence of a nitration promoting catalyst which consists essentially of the adduct of:

(a) a Group 4b-Group 3b mixed oxide composition represented by the emprical formula:

$$(M^1_aM^2_bO_c)_x(NO_2)_y$$

wherein M^1 is at least one element selected from Group 4b of the Periodic Table of the Elements, M^2 is at least one element selected from Group 3b of the Periodic Table of the Elements, a is 1, b is 0 to 20, c is a number taken to satisfy the average valences of M^1 and M^2 in the oxidation states in which they exist inthe composition, x is 1, and y is 0 to c, and

(b) a catalytically effective amount of sulfur trioxide.

4,618,734

METHOD OF MAKING AND POLYMERIZING PERFLUOROALKYLENE ACETYLENE COMPOUNDS

Kurt Baum, Pasadena; Ronald O. Hunadi, Los Angeles, and Clifford D. Bedford, Mountain View, all of Calif., assignors to Fluorochem Inc., Asuza, Calif.

Continuation-in-part of Ser. No. 412,929, Aug. 30, 1982, abandoned, which is a division of Ser. No. 219,938, Dec. 24, 1980, Pat. No. 4,347,376. This application Aug. 12, 1983, Ser. No. 522,605
Int. Cl.[4] C07C *21/22*
U.S. Cl. 570—136 2 Claims

1. As a composition of matter, a perfluoroalkylene α,ω-diacetylene having the formula $HC{\equiv}C(CF_2)_nC{\equiv}CH$, wherein n is a whole number from 5 to about 20, inclusive.

4,618,735

PROCESS AND APPARATUS FOR THE CONVERSION OF SLUDGES

Trevor R. Bridle, Burlington, and Herbert W. Campbell, Dundas, both of Canada, assignors to Canadian Patents and Development Limited; Societe des Brevets et D'Exploritation Limited, both of Ottawa, Canada

Filed Aug. 29, 1984, Ser. No. 645,149
Claims priority, application Canada, Sep. 13, 1983, 436601
Int. Cl.[4] C07C *1/00*
U.S. Cl. 585—240 14 Claims

1. Process for the conversion of sludge to produce oil products and sludge residue comprising the steps of:

(a) converting the sludge to the form of dried sludge;

(b) heating the dried sludge in a heating zone in the absence of oxygen to a temperature of at least 250° C. for the volatilization of organic products therefrom, resulting in heating zone gaseous organic products and sludge residue;

(c) removing the said gaseous organic products and the sludge residue from the heating zone and delivering them to a reaction zone;

(d) heating the reaction zone to establish therein a reaction temperature of from 280° C. to 600° C.;

(e) contacting the sludge residue in the reaction zone with the heating zone gaseous organic products in the absence of oxygen at the reaction temperature with repeated intimate gas/solid contact to cause reactions of the heating zone gaseous organic products catalysed by the heated sludge residue resulting in reaction zone gaseous products containing oil prbducts;

(f) removing the reaction zone gaseous products of step e from the reaction zone and separating at least the oil products therefrom.

4,618,736

CONVERSION OF A MUNICIPAL WASTE TO FUEL

Frederick R. Benn, Sale, and Charles A. McAuliffe, Altrincham, both of England, assignors to Salford University Industrial Centre Limited, Manchester, England

Continuation-in-part of Ser. No. 549,543, Nov. 4, 1983, abandoned, which is a continuation-in-part of Ser. No. 331,732, Dec. 17, 1981, abandoned. This application Aug. 6, 1985, Ser. No. 763,049
Claims priority, application United Kingdom, Dec. 18, 1980, 8040489
Int. Cl.[4] C10G *1/06*
U.S. Cl. 585—240 8 Claims

1. A process for production of hydrocarbons from cellulosic material comprising the steps of forming a suspension of cellulosic material in a liquid polycyclic hydrogen donor substance, the suspension containing an amount of water equal to at least about 5%, but no more than about 10%, by weight of the cellulosic material, subjecting the suspension to a temperature above 200° C. and a pressure which increases to at least 1000 psi, in the presence of hydrogen, to bring about hydrogenation of the cellulosic material and produce a mixture of gaseous, liquid, and solid hydrocarbons having an oxygen content

below 10% by weight and a calorific value greater than 15,000 Btu/lb, separating the mixture of hydrocarbons into gaseous, liquid, and solid phases, and recovering liquid polycyclic hydrogen donor substance from the liquid phase and recycling said recovered liquid hydrogen donor substance for treatment of fresh cellulosic material.

4,618,737

PEROXIDE-INDUCED POLYMERIZATION OF MOGD LIQUIDS TO HIGH VISCOSITY LUBES

Arthur W. Chester, Cherry Hill; William E. Garwood, Haddonfield, and Samuel A. Tabak, Wenonah, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 13, 1985, Ser. No. 808,705

Int. Cl.[4] C07C *2/02*

U.S. Cl. 585—329 **15 Claims**

1. A multi-stage process for producing lubricant range hydrocarbons by oligomerizing a low olefin feedstock which comprises contacting said lower olefin feedstock in a first reactor stage under oligomerizing conditions with a medium pore shape-selective siliceous zeolite catalyst and contacting at least a portion of the first stage effluent in a second reactor stage with a ditertiary alkyl peroxide catalyst to produce a high viscosity lubricant range hydrocarbon.

4,618,738

HYDROCARBON CONVERSION PROCESS WITH CATALYTICALLY ACTIVE AMORPHOUS SILICA

Dean A. Young, Yorba Linda, and Jeffery W. Koepke, La Habra, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 645,920, Aug. 29, 1984, Pat. No. 4,548,705, which is a division of Ser. No. 526,866, Aug. 25, 1983, Pat. No. 4,481,102, which is a division of Ser. No. 356,351, Mar. 9, 1982, Pat. No. 4,414,137. This application Jul. 29, 1985, Ser. No. 760,077

Int. Cl.[4] C07C *5/22*

U.S. Cl. 585—480 **25 Claims**

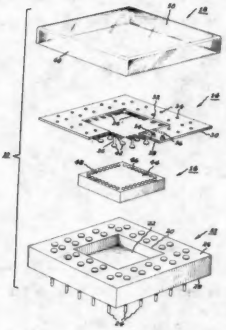
1. An isomerization process comprising contacting a hydrocarbon comprising ortho-xylene under isomerization conditions including an elevated temperature with a catalyst prepared by a method comprising forming a hydrogel or precipitate in a reaction mixture comprising water, silicate anions and an organic reactant selected from the group consisting of amines having a pK_a value above about 10.0, quaternary ammonium cations having a nitrogen atom bonded to four carbon atoms, quaternary phosphonium cations having a phosphorus atom bonded to four carbon atoms, precursors of the foregoing and mixtures thereof, and dehydrating the resultant hydrogel or precipitate to yield a product containing amorphous silica, said isomerization conditions are such that at least a portion of said ortho-xylene is converted to para-xylene or meta-xylene.

4,618,739

PLASTIC CHIP CARRIER PACKAGE

Paul R. Theobald, Signal Mountain, Tenn., assignor to General Electric Company, Schenectady, N.Y.

Filed May 20, 1985, Ser. No. 736,019
Int. Cl.[4] H01L *23/02*
U.S. Cl. 174—52 FP 28 Claims



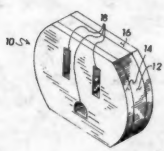
1. A pin grid array integrated circuit chip carrier package comprising a planar main body member of a first synthetic organic polymer having a centrally disposed chip connect recess cavity and top and bottom surfaces, the base of said recess being formed with a material having greater thermal conductivity than said first synthetic organic polymer, terminal pins extending from the top surface of said main body member and protruding from its bottom surface, and a metallized layer of a second synthetic organic polymer being bonded to the top surface of said body member to enable electrical interconnection between the chip and said terminal pins, said electrical interconnection including a metallized trace deposited on the bottom surface of said metallized layer which further includes through holes extending from the top surface of said second polymer to the bottom surface of said metalized layer and terminating in spaced apart metallized pads located on the bottom surface of said metallized layer which are in registration with the terminal pin pattern of the body member.

4,618,740

ELECTRICAL OUTLET SAFETY DEVICE

Edgar C. Ray, Rte. 2, Box 137, Buffalo Lake, Minn. 55314, and William A. Kohl, P.O. Box 1154, Marshall, Minn. 56258

Filed Nov. 6, 1985, Ser. No. 795,529
Int. Cl.[4] H01R *13/44*
U.S. Cl. 174—67 4 Claims



1. A safety device for attachment to an electrical outlet comprising:

an adhesive core comprising a tear resistant resilient material, the adhesive core having openings and a general size and shape corresponding to the electrical outlet to which it is to be attached, the adhesive core capable of securing a male electrical plug to a female electrical outlet, the adhesive core having a first and a second surface;

a peel-away backing mated to the first surface of the adhesive core, and protecting the first surface of the adhesive core, to be peeled away prior to attachment of the safety device to an electrical outlet; and

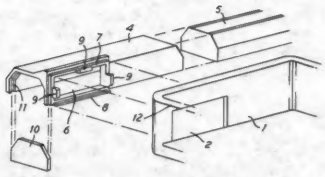
a front cover mated to the second surface of the adhesive core, the front cover adhesively secured to the adhesive core, the front cover impermeable to the insertion of objects into the female electrical outlet, the front cover removable to allow insertion of the male electrical plug.

4,618,741

ADAPTOR FOR CONNECTING RACEWAY TRUNKING TO A BOX FOR ELECTRICAL COMPONENTS, AND THE ADAPTOR AND BOX IN COMBINATION

David W. Bramwell, Prestatyn, United Kingdom, assignor to EGA Limited, United Kingdom

Filed Jul. 9, 1984, Ser. No. 628,725
Int. Cl.[4] H02G *3/04, 3/06*
U.S. Cl. 174—68 C 14 Claims



1. An adaptor for connecting raceway trunking to a box for electrical components, comprising an open-ended, elongate channel member to contain a length of raceway trunking therethrough or thereinto, a side wall of the channel member having a hole and the channel member having integral, snap-fitting means for attaching it to a box with the hole in registry with a corresponding aperture in a wall of the box.

8. In combination, a box for electrical components and an adaptor for connecting raceway trunking to the box, the adaptor comprising an open-ended, elongate channel member to contain a length of raceway trunking running therethrough or thereinto, a side wall of the channel member having a hole and the channel member having integral, snap-fitting means for attaching it to the box; and the box comprising walls and an aperture in at least one of the walls of the box, said aperture being intended to be in registry with the hole in the channel member when the adaptor is attached to the box.

4,618,742

METHOD AND APPARATUS FOR DECODING AUDIOFREQUENCY INFORMATION SENT THROUGH ROTARY DIALING

Horacio Castro, El Salvador 5962, Buenos Aires (1414), Argentina

Filed Mar. 25, 1983, Ser. No. 479,026
Claims priority, application Argentina, Mar. 31, 1982, 288969
Int. Cl.[4] H04M *11/00*
U.S. Cl. 179—2 A 9 Claims

1. A method for decoding audiofrequency information sent through rotary dialing from a calling phone set during the conversation period established over a phone line with a called party, wherein said method comprises the steps of:

(A) sending from the calling end of said phone line the series of characters corresponding to the phone number of the called party, and, after closure of the d.c. current or conversation circuit;

(B) sending said audiofrequency information through rotary dialing from the calling party;

(C) decoding said audiofrequency information at the called party, said decoding comprising the steps of:

(1) substantially converting every audiofrequency information into square wave signals;

(2) determining the presence of the first square wave signal produced by the beginning of the first pulse of a phone pulse train;

(3) ignoring the presence of square wave signals during a first time period of approximately 50 milliseconds initiated as from the determination of the presence of said first square wave signal;

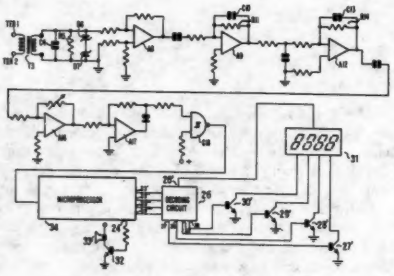
(4) determining the presence of the second square wave signal produced by the ending of said phone pulse, within a second time period of approximately 30 milliseconds initiated immediately after said first time period has elapsed;

(5) converting said first and second square wave signals into logic data or into a single pulse;

(6) ignoring the presence of square wave signals within a third time period of approximately 30 milliseconds initiated as from the determination of the presence of said second square wave signal;

(7) determining, should the beginning of an additional phone pulse take place, the presence of an additional square wave signal within a fourth time period of approximately 50 milliseconds initiated immediately after said third time period has elapsed;

(8) determining the presence of the second additional



square wave signal produced by the ending of said additional phone pulse, as in steps 3 and 4;

(9) converting said first and second additional square wave signals produced by said additional phone pulse into new logic data or into a new single pulse;

(10) determining the presence of possible square wave additional signals produced by possible additional phone pulses, as in steps 6, 7 and 8;

(11) converting into logic data or single pulses said possible square wave additional signals produced by said possible additional phone pulses;

(12) determining the ending of a said phone pulse train when the presence of an additional square wave signal is not determined within a fourth time period or within a second time period;

(13) ignoring the presence of square wave signals within a time period of approximately 300 milliseconds initiated immediately after a said fourth time period has elapsed or within a time period of approximately 220 milliseconds initiated immediately after a said second time period has elapsed, when the presence of an additional square wave signal is not determined within a said fourth time period or within a said second time period;

(14) recycling back to step 2;

(D) applying said logic data or single pulses to commanding, ordering or informing means.

2. An apparatus for decoding audiofrequency information sent through rotary dialing from a calling phone set during the conversation period established with a called party over a phone line, wherein it comprises a signal limiting means capable of being connected to the phone line; an operational amplifier means coupled to said limiting means, said operational amplifier including a filter means for eliminating a portion of the signals received from said limiting means; a level regulator coupled to said operational amplifier means; a rectifier coupled to said level regulator; a trigger coupled to said rectifier; an integrator coupled to said trigger; and a counter with one input being connected to the output of said microprocessor and at least one output coupled to indicating means.

4,618,743

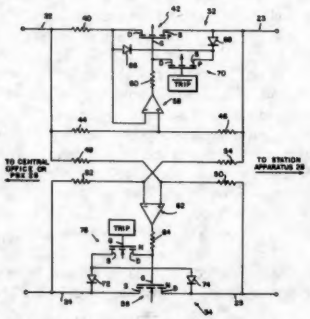
MONOLITHIC TRANSIENT PROTECTOR

Scott L. Falater, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Nov. 27, 1984, Ser. No. 675,222

Int. Cl.[4] H04B *3/36*

U.S. Cl. 179—16 AA **12 Claims**



1. Apparatus for use with a telephone circuit including a source of telephone service, a station apparatus and first and second conductors for coupling the source of telepnone service and the station apparatus, the apparatus comprising:

first and second current-limiting circuits including first and second variable impedance means respectively each having first and second terminals for insertion in series into a respective one of said first and second conductors for providing a main current conducting path and having a control terminal to control the respective variable impedance means;

first means for supplying a signal representative of an impedance of said first conductor to be synthesized to said control terminal of said first variable impedance means to provide a synthesized impedance of said first conductor; and

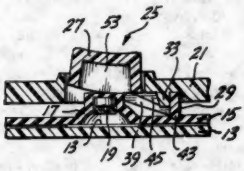
second means for monitoring an impedance of said second conductor, for comparing said synthesized impedance of said first conductor and monitored impedance of said second conductor and for supplying a matching signal to said control terminal of said second variable impedance means for matching said monitored impedance of said second conductor to said synthesized impedance of said first conductor.

4,618,744

ROCKER KEY ELASTOMER DOME KEYBOARD

Kent M. Pope, and Bryan L. Hardesty, both of Coeur d'Alene, Id., assignors to Advanced Input Devices, Inc., Coeur d'Alene, Id.

Filed Apr. 29, 1985, Ser. No. 728,231
Int. Cl.[4] H01H *13/70*
U.S. Cl. 200—5 A 19 Claims



1. A rocker key elastomer dome keyboard comprising:

a printed wire board having an array of spaced apart switch contacts located on one surface;

an elastomer dome keypad positioned so as to overlay the surface of said printed wire board on which said array of spaced apart switch contacts are located, said elastomer dome keypad formed of a layer of elastomeric material having a plurality of domes formed in said layer, said domes being aligned with said array of spaced apart switch contacts, said domes including conducting means positioned such that the collapsing of said domes results in said conducting means being brought into electrical contact with the spaced apart switch contacts aligned with said conducting means;

a bezel positioned so as to overlay said elastomer dome keypad on the side thereof remote from said printed wire board, said bezel including a plurality of apertures, said apertures aligned with said domes of said elastomer dome keypad;

a plurality of keys positioned in said apertures in said bezel such that said keys impinge on the tops of the domes aligned with said apertures in said bezel, the region of said keys that impinge on said domes formed so as to apply a collapsing force to the center of said dome that causes the center of said domes to collapse in an even, positive manner when the keys follow an arcuate path of travel, each of said keys including a button portion and a flange portion, said button portions passing through said apertures in said bezel; and,

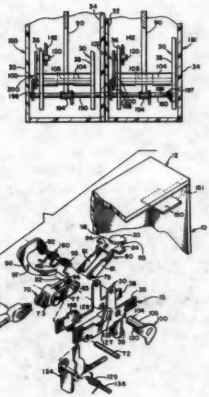
rotary mounting means for attaching said keys to said bezel such that the path of travel of said keys is arcuate, said rotary mounting means comprising two spaced apart apertures formed in the flange of each of said keys and two corresponding spaced apart protrusions, one aligned with each of said apertures in said flange, extending outwardly from said bezel on the side thereof facing said elastomer dome keypad.

4,618,745

CIRCUIT BREAKER MECHANISM

Harry A. Thompson, III, Lawrenceville, N.J., assignor to Heinemann Electric Company, Lawrenceville, N.J.

Filed Apr. 1, 1985, Ser. No. 718,081
Int. Cl.[4] H01H *9/26, 3/00*
U.S. Cl. 200—50 C 39 Claims



35. A circuit breaker mechanism comprising:

(A) a frame;

(B) a pair of contacts supported relative to the frame displaceable relative to one another between open and closed positions;

(C) a contact arm rotatably supported at a pin having an integral contact support carrying one of the contacts and being rotatable about said pin to open and close the contacts;

(D) a cradle arm rotatably mounted on the frame, said cradle arm being rotatable between a latched position and an unlatched position;

(E) an over-center extension spring connected between a connection on the contact arm and a connection on the cradle arm for biasing said contact arm into over-center positions about the contact arm pin;

(F) latch means having a displaceable latch and a latch spring supported relative to the frame, said latch spring biasing said latch into a latching position so that the latch releasably engages and latches said cradle arm in the latched position wherein the over-center spring holds the cradle arm against the latch;

(G) an actuator link rotatably mounted on the frame and pivotally coupled with the contact arm at the contact arm pin to provide the contact arm pivot so that when the cradle arm is held against the latch in the latched position movement of said actuator link from a first position to a second position displaces the pivot of the contact arm over center relative to the connections on the cradle arm and the contact arm causing the over-center biasing means to displace said contact arm to close the contacts;

(H) trip means supported relative to the frame for releasing the latch means under predetermined conditions, said trip means having a displaceable trip element for engaging and displacing said latch against the bias of the latch spring

under said predetermined conditions to disengage said latch from said cradle arm to permit displacement of the cradle arm by the over-center spring from the latched position to the unlatched position causing the connection on the cradle arm to move relative to the pivot of the contact arm so that the pivot of the contact arm is passed over-center relative to the connections on the contact arm and the cradle arm causing the over-center spring to displace said contact arm to open the contacts; and

(I) a cradle arm return spring connected between the frame and the cradle arm to displace the cradle arm from the unlatched position back to the latched position causing the actuator link to return from the second position back to the first position as the over-center spring biases the contact arm to hold the contacts open.

4,618,746

BALL ACTUATED POSITION SENSITIVE SWITCH

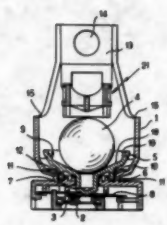
Pierre Schwob, Lyons, and Marcel Dimey, Grandfontaine, both of France, assignors to SEB S.A., Selongey, France

Filed Jun. 4, 1985, Ser. No. 741,292

Claims priority, application France, Jun. 5, 1984, 84 08775

Int. Cl.⁴ H01H *35/14*

U.S. Cl. 200—61.45 R **11 Claims**



1. A multi-directional switch comprising:

a housing comprising two electrical contacts, one of said contacts being movable between a closed position and an open position;

an actuating member movably disposed in the housing and having a control portion engaging the movable contact and a cup-shaped recess opening away from the contacts;

mutually engageable first and second fulcrum means provided respectively on the actuating member and in the housing, radially between a deepest area of the cup-shaped recess and an outer edge of the cup-shaped recess;

a ball movable in the housing;

the housing being internally shaped so as to limit movement of the actuating member and of the ball, and maintain the ball in the cup-shaped recess, and the first and second fulcrum means in a mutually facing relationship;

wherein the control portion controls displacement of the movable contact into one of its positions when the actuating member is in a seated position in which the first and second fulcrum means are mutually engaged all around the deepest area, whereas the control portion controls displacement of the movable contact into its other of said closed and open positions when the actuating member is in a tilted-away position with the first and second fulcrum means being at least partly lifted from one another.

4,618,747

ELECTRICAL SNAP SWITCH WITH DOUBLE ARM RESETTING LEVER

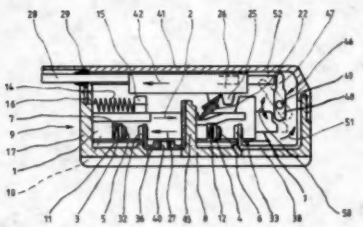
Alois Schaffeler, Spaichingen, Fed. Rep. of Germany, assignor to Marquardt GmbH, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,341

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1983, 3336338

Int. Cl.⁴ H01H *5/06, 15/18*

U.S. Cl. 200—67 PK **3 Claims**



1. An electrical switch comprising a housing, first and second fixed contacts arranged in spaced relationship in said housing, a slide movably mounted on a movement path in said housing and having first and second spaced apart movable contacts thereon which are moved therewith into a contact making position in which they engage respective first and second fixed contacts, spring means urging said slide out of a contact making position, an actuating plunger movable on another movement path in said housing backwardly and forwardly substantially parallel to said slide, said slide and said plunger having adjacent ends in said housing with the end of said slide being spaced from said movable contacts, a snap spring engaged between said plunger in said slide being effective to snap said slide rapidly into and out of a contact making position when said plunger is moved in said housing in a predetermined direction, and a two armed resetting lever pivotally mounted in and to said housing at a fixed location between said plunger and said slide alongside the adjacent ends thereof and between said movement paths, said resetting lever having respective first and second arm portions extending in a straight line on opposite sides of said fixed location and positioned so that they engage the ends of the respective plunger and slide so that when said plunger is moved in a predetermined direction said slide is snapped in a corresponding opposite direction by said resetting lever which is pivoted in snap fashion by engagement with said plunger to cause said resetting member to slap and rapidly move said slide.

4,618,748

SWITCHING DEVICE FOR ELECTRICAL SWITCHING APPARATUS

Manfred Mueller, Amberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Oct. 15, 1984, Ser. No. 661,094

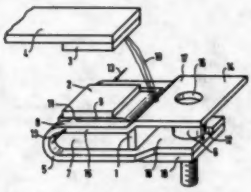
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1983, 3337515

Int. Cl.⁴ H01H *33/20*

U.S. Cl. 200—144 R **4 Claims**

1. In a switching means for electrical switchgear having a pair of contacts, particularly a contactor, with a substantially linear current lead and an arc deflector arranged adjacent the contact portion, said arc deflector forming a U the free end of which accepts an arc drawn between said contacts, said U being aligned approximately at the level of one of the contacts, the improvement comprising a step-shaped current lead bearing a contact and an arc deflector having a U-shape, one leg portion of the U lying in the area of the stationary contact

being offset parallel to the contact, while the other leg portion of the U is penetrated by a fastening bolt and rests against the



contact-bearing side of the free end of the step-shaped offset current lead.

4,618,749

SOLID INSULATOR-TYPE VACUUM SWITCH GEAR

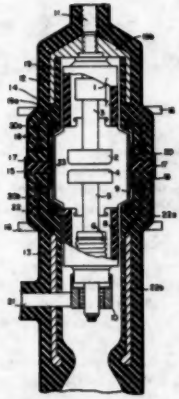
Klaus Böhme, Dresden; Wolfgang Beyer, Radebeul; Günter Seibt, Dresden, and Michael Digmayer, Nossen, all of German Democratic Rep., assignors to VEB Otto Buchwitz Starkstrom Anlagebau Dresden, Dresden, German Democratic Rep.

Filed Sep. 18, 1985, Ser. No. 777,225

Claims priority, application German Democratic Rep., Sep. 24, 1984, 267532

Int. Cl.[4] H01H *33/66*

U.S. Cl. 200—144 B 11 Claims



1. A vacuum switching apparatus comprising a housing made from an insulating material, a cover means on the outer surface of said housing, said cover means adapted to be connected to ground potential, a vacuum switching chamber placed into said housing, a fixed and a movable contact member mounted in said vacuum switching chamber and each extending through said housing and forming a terminal means, said insulating housing and said vacuum switching chamber forming a space therebetween, gas filling said space, a pair of control electrodes embedded in said insulating housing axially spaced from each other, each of said pair of control electrodes being conductively coupled to a different one of said terminal means, and a further electrode means spaced from said pair of electrode means between said insulating housing and in a region of said insulating housing located with respect to said switching chamber in such a manner that said further electrode is at an electric potential lying between the potential of said terminal means and said ground potential.

4,618,750

VACUUM SWITCHING TUBE WITH A COIL FOR GENERATING A MAGNETIC FIELD

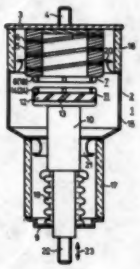
Karl Zückler, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,697

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1984, 3422949

Int. Cl.[4] H01H *33/66*

U.S. Cl. 200—144 B 5 Claims



1. A vacuum switching tube having a housing, a stationary contact and a movable contact disposed in the housing, said movable contact being movable in a straight line relative to the stationary contact, said switching tube further comprising coil means carrying the current to be switched by the switching tube for generating a magnetic field extending in the space between the contacts, said coil means having two sections, a first and substantially larger section of said coil means being disposed on the stationary contact and the second and smaller section being disposed on the movable contact.

4,618,751

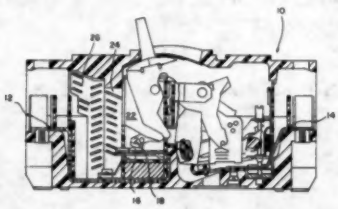
ARC EXTINGUISHING ASSEMBLY

Eugene W. Wehr; Clark L. Oster, and Terence J. Evans, all of Cedar Rapids, Iowa, assignors to Square D Company, Palatine, Ill.

Filed Dec. 21, 1984, Ser. No. 684,559

Int. Cl.[4] H01H *33/08*

U.S. Cl. 200—144 R 7 Claims



1. An arc suppressing assembly for a circuit breaker having at least one pair of separable contacts comprising;

an arc stack assembly;

a baffle assembly in facing relationship with said arc stack assembly, said arc stack assembly intermediate said baffle assembly and said contacts;

said arc stack assembly comprising a pair of insulating support legs having a plurality of slots provided therein, a plurality of arc plates having a tab at each side, said tabs respectively received within said slots of the side legs to retain said arc plates between said side legs, said baffle assembly comprising a pair of insulating side supports

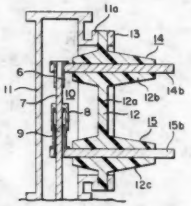
including a plurality of slots provided therein, a plurality of insulating baffles provided with a tab at each side, said tabs received within respective slots within said side supports.

4,618,752

GAS-INSULATED INTERRUPTER

Yukio Ozaki, Amagasaki; Osamu Fujisawa, Kobe; Ryukichi Sakai, Itami, and Hiroshi Hasegawa, Marugame, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1985, Ser. No. 693,894
Claims priority, application Japan, Jan. 24, 1984, 59-9509
Int. Cl.[4] H01H *33/54*
U.S. Cl. 200—148 R **3 Claims**



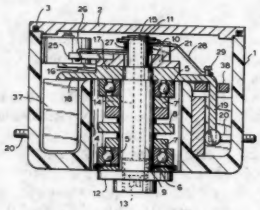
1. A gas-insulated interrupter comprising:
an interrupting unit;
a pair of rigid terminal conductors connected to and extending substantially parallel to each other from said interrupting unit at spaced positions, each one of said terminal conductors having connector elements extending toward the other of said terminal conductors and forming part of said interrupting unit;
a hermetically-sealable housing enclosing said interrupting unit, said housing having therein a single opening sufficiently large to allow said interrupting unit and said terminal conductors, including said connector elements, as assembled to pass therethrough to locate said connector elements within said housing;
means secured to said terminal conductors for hermetically closing said opening in said housing while mechanically rigidly supporting said terminal conductors and said interrupting unit; and
an electrically insulating gas disposed within said housing.

4,618,753

INSULATING CHAMBER

Hans H. Heyde, Itajai-SC, and Julio A. Echeverria, Sao Paulo-SP, both of Brazil, assignors to Lorenzetti-Inebrasa S/A., Itajai-Santa Catarina, Brazil

Filed Dec. 6, 1984, Ser. No. 679,017
Int. Cl.[4] H01H *33/56*
U.S. Cl. 200—148 G **12 Claims**



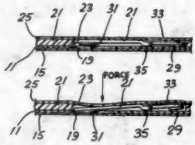
1. An insulating chamber for connecting and disconnecting electric switches in medium and high voltage overhead lines so as to quench any electric arc formed, comprising:
a closed and sealed casing containing pressurized sulfur hexafluoride gas for quenching the arc;
at least one fixed contact;
a rotatable shaft provided in said casing and having a length and lower and upper ends;
at least one movable contact rotatably driven by said shaft for engaging said fixed contact; and
spring means engaging said shaft for rotatably driving said shaft so that said movable contact engages said fixed contact,
said rotatable shaft having a first shaft portion beginning at said lower end and extending along a majority of said length for mounting said shaft, a second shaft portion extending above and having a diameter smaller than said first shaft portion for mounting said movable contact, and a third shaft portion extending from said second shaft portion to said upper end of said shaft.

4,618,754

MEMBRANE SWITCH WITH PIVOTABLE ROCKER

David Gross, 2128 Duxbury Cir., Los Angeles, Calif. 90034

Filed Jun. 17, 1985, Ser. No. 745,694
Int. Cl.[4] H01H *13/52*
U.S. Cl. 200—159 B **22 Claims**



1. A normally closed membrane switch comprising:
a circuit board having an electrical contact fixed thereon;
rocker means located immediately above the circuit board and including a first end and a second end, the first end having an electrical contact on its underside, normally positioned to electrically contact the circuit board contact, and the second end being normally spaced a predetermined distance above the circuit board; and
positioning means for holding the rocker means in its prescribed position above the circuit board, the positioning means including a resilient membrane overlaying the rocker means;
wherein a downward force applied to the portion of the resilient membrane overlaying the second end of the rocker means pivotally lifts the rocker means contact out of electrical contact with the circuit board contact, against the yielding resistance of the resilient membrane, and wherein, upon removal of the downward force, the resilient membrane forceably returns the rocker means to its normal position, with the rocker means contact again electrically contacting the circuit board contact.

4,618,755

UNIVERSAL MATRIX SWITCHING DEVICE

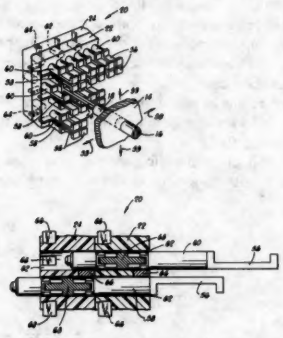
John E. Wallace, Athens, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed May 28, 1985, Ser. No. 737,941
Int. Cl.[4] H01H *63/00, 67/00;* H02B *1/02*
U.S. Cl. 200—175 **9 Claims**

1. A universal matrix switching device connected to an electronic controller for matrix switching two sets of electric signal pairs, the device comprising:
a position table with plate having a plurality of actuators mounted thereon, the actuators under electronic control;

a matrix board having a plurality of apertures therethrough and slots cut on both sides of the board and orthogonally oriented with the slots forming a grid pattern, the slots and apertures slightly overlapping;

transmission conductor strips received in the slots for conducting a signal input to output; and



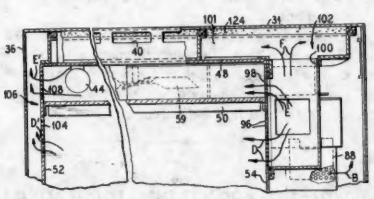
a plurality of movable pins received in the apertures in the matrix board and having electrical contacts therearound, one end of the pins extending outwardly from the matrix board for engagement with the actuators, the actuators when actuated engaging the pins for moving the pins in the matrix board and providing contact between the transmission conductor strips in the slots on both sides of the matrix board.

4,618,756

AIR CIRCULATION SYSTEM FOR MICROWAVE OVEN

John R. Schwaderer, Claridon Township, Marion County, and Mark J. Kristof, Marion Township, Marion County, both of Ohio, assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 8, 1985, Ser. No. 752,816
Int. Cl.[4] H05B 6/64
U.S. Cl. 219—10.55 R **13 Claims**



1. In a microwave oven having an outer oven cabinet with a front opening door, an inner oven cooking cavity accessed through the door and divided by a panel into a lower cooking area and an upper lighting area with a light bulb, air inlets and outlets in both the oven cabinet and cavity and an air blower in the cabinet to provide an air flow through the inlets and outlets in the cabinet and cavity, means for dividing the air flow from the blower into three spearate air streams comprising:

a first means for directing an air stream through only the cooking cavity lower area and out the front of the oven cabinet;

a second means for directing an air stream through only the cooking cavity upper area, across the light bulb and out the front of the oven cabinet;

said panel forming an air barrier between said cavity lower area and said cavity upper area to prevent the air stream from passing from said cavity upper area to said cavity lower area; and

a third means for directing an air stream to bypass the cooking cavity and exit directly out of the front of the oven cabinet;

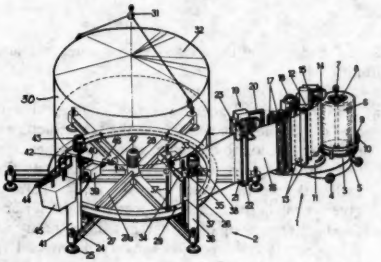
whereby predetermined proportions of the air flow through the oven cabinet can be directed through each of the individual air streams.

4,618,757

METHOD AND APPARATUS FOR MANUFACTURING LARGE, METAL CYLINDRICAL STRUCTURES

Pierre Cabany, Riorges-Roanne; Andre Gardette, Le Coteau; Xavier Jacquet, Le Coteau; Aurelio Tollis, Le Coteau, and Fernando Tollis, Le Coteau, all of France, assignors to Constructions Soudees du Coteau, Le Coteau, France

Filed Sep. 6, 1984, Ser. No. 647,799
Claims priority, application France, Sep. 6, 1983, 83 14227
Int. Cl.[4] B23K 9/02
U.S. Cl. 219—60 R **7 Claims**



1. An apparatus for manufacturing a large-sized cylindrical metal casing by forming and welding successive cylindrical sections, said apparatus comprising:

a coil unwinding device with a vertical spindle and a support disc for unwinding a metal strip from a coil of said strip;

a device for forming and treating said metal strip;

a device for severing a sheet from said strip by cutting said strip to form vertical edges;

a turntable comprising a base and a rotating table made of a ring mounted on rollers, at least one of said rollers being driven at an adjustable speed to form each new cylindrical section from said sheet;

raising means for raising a casing being assembled above a subsequent section to be formed;

welding means for welding together the vertical edges of a raised cylindrical section and a subsequent section located under the raised casing;

a pair of rigid vertical columns integrally fixed to said base of the said turntable and each supporting a roller carriage displaceable vertically by means of a screw, said carriage carrying a jack capable of pressing a roller against the cylindrical section, the two columns and carriages supported thereby being arranged one on the outside and the other on the inside with respect to the rotating table, a variable-speed gear motor being arranged to drive both said screws at the same speed; and

a third column integrally fixed to said base of said turntable and carrying a welding carriage movable vertically under the action of a screw driven by a variable-speed gear motor, said welding carriage carrying a welding head with auxiliary supply elements therefor.

4,618,758

FOCUSING HEAD FOR A LASER-BEAM CUTTING MACHINE

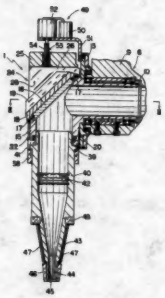
Luigi Gilli, and Domenico Peiretti, both of Turin, Italy, assignors to Prima Industrie S.p.A., Italy

Filed May 21, 1985, Ser. No. 736,649

Claims priority, application Italy, May 22, 1984, 67512 A/84

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121 LG **6 Claims**



1. A focusing head for a laser-beam cutting machine, comprising:

a focusing moving structure;

a focusing lens and an output nozzle, integral with each other, and being connectable to the said structure so as to move, in relation to the same, around two axes combining to form an angle, so as to move the said nozzle along any path and keep the center of said lens, in operation, at a given constant theoretical distance from the surface of the sheet material being cut; wherein the said head comprises a first and second portion moving, in mutual manner, axially parallel to the optical axis of the said lens and to the axis of the said nozzle;

one of the said two portions comprising the said nozzle, the said lens and sensor means for sensing the distance of the center of said lens from the said surface of the sheet material;

a servomechanism, controlled by the said sensor means, said servomechanism being mounted between the said two portions for moving them mutually in the said axial direction, so as to keep the center of said lens, in operation, at at given constant real distance from the said surface of the said sheet material;

the said sensor means comprising a sliding-contact sensor mounted in axially sliding manner onto the output end of the said nozzle and projecting from it so as to slide in operation essentially contacting the said sheet material.

4,618,759

BEAM POSITION CONTROL FOR A LASER MACHINE DEVICE

Gerhard Müller, Aalen; Gerhard Hohberg, Oberkochen, and Peter Greve, Essingen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Feb. 13, 1985, Ser. No. 701,167

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406677

Int. Cl.[4] B23K *27/00*

U.S. Cl. 219—121 LR **7 Claims**

1. Arrangement for compensating for the excursion of a laser beam guided along a predetermined path line by a deflecting optical system made up of a plurality of deflecting components for deflecting the laser beam, the arrangement comprising:

a first one of said deflecting components being configured so as to be changeable in position so as to alter and adjust the spatial position of said laser beam;

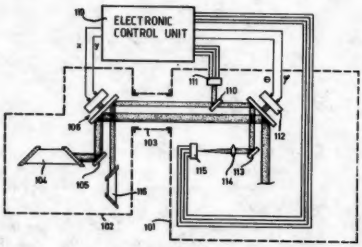
a first photoelectric detector corresponding to said first deflections component and being configured so as to generate a first output signal indicative of the position of rays of light impinging thereon;

means for generating a bundle of rays of light travelling parallel to said path line;

first diverting means disposed downstream of said first deflecting component for diverting a first portion of the rays of said bundle away from said path line so as to impinge on said first detector;

a second one of said deflecting components being configured so as to be changeable in position so as to alter and adjust the angular position of said laser beam;

a second photoelectric detector corresponding to said second deflecting component and being configured so as to



generate a second output signal indicative of the position of rays of light impinging thereon;

second diverting means disposed downstream of said second deflecting component for diverting a second portion of the rays of said bundle away from said path line so as to impinge on said second detector; and,

a control unit for receiving said first and second output signals and for generating respective control signals corresponding thereto, said control signals being supplied to said first and second deflecting components to change the respective position thereof to compensate for said excursion by correcting the spatial and angular positions of said beam; and,

said second deflecting component and said second diverting means both being disposed downstream of said first one of said deflecting components whereby said second deflecting component also compensates for angular errors introduced by said first deflecting component.

4,618,760

SHIELDED ARC WELDING USING AUXILIARY VOLTAGE

Michael G. Murch, Royston, and Geoffrey B. Melton, Gt Abington. both of England, assignors to The Welding Institute, Cambridge, England

Filed Jan. 8, 1985, Ser. No. 689,712

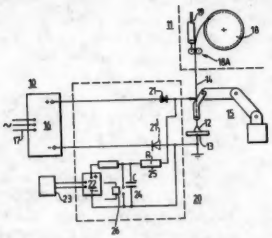
Claims priority, application United Kingdom, Jan. 11, 1984, 8400685

Int. Cl.[4] B23K *9/06*

U.S. Cl. 219—130.4 **15 Claims**

7. A method of shielded arc welding using a consumable electrode, said method comprising applying a welding voltage between said electrode and a workpiece; applying an auxiliary, unipolar voltage between said electrode and said workpiece; and advancing said electrode towards said workpiece while said auxiliary voltage is applied, wherein said magnitude of said auxiliary voltage generally increases from an initial value

to a value at which an arc is initiated between said electrode and said workpiece, whereby said auxiliary voltage initiates



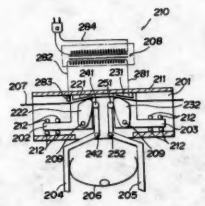
said arc between said electrode and said workpiece before said electrode engages said workpiece.

4,618,761

ELECTRODE CUTTING APPARATUS FOR WIRE CUT ELECTRIC DISCHARGE MACHINE

Kiyoshi Inoue, Tokyo, and Tatsue Toyoshima, Kawasakishi, both of Japan, assignors to Inoue-Japax Research Incorporation, Yokohamashi, Japan

Filed Sep. 14, 1983, Ser. No. 532,177
Int. Cl.[4] B23P *1/08*
U.S. Cl. 219—517 **10 Claims**



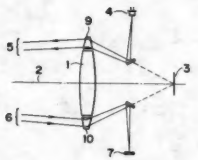
1. A wire electrode cutting apparatus for a wire-cut electric discharge machine, comprising means for applying a predetermined tensile force to a portion of a wire electrode to be cut and means for supplying electrical current in a predetermined magnitude to said portion to heat said portion to soften the same in concurrence with the application of tensile force thereto the effect cutting of the wire electrode by the combination of the heating of the wire with application of tensile force thereto, said means for supplying electrical current comprising a contact holder movably supported for displacement towards and away from the wire electrode, a pair of spaced contacts positioned on said contact holder to contact the wire electrode at spaced locations on opposite sides of the location where the wire electrode is to be cut without substantially affecting the tensile force in the wire whereby the heating of the wire and the application of tensile force are applied to the wire at separate locations and control means for displacing the contact holder to bring the contacts into contact with the wire electrode and for operating the electrical current supplying means when the tensile force in said wire reaches a predetermined value.

4,618,762

IN-FOCUS POSITION DETECTING APPARATUS

Jun Hattori, and Sadahiko Tsuji, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1983, Ser. No. 563,584
Claims priority, application Japan, Dec. 27, 1982, 57-231428
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **5 Claims**



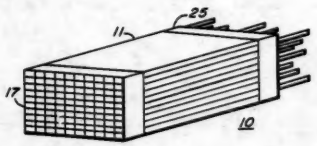
1. An in-focus position detecting optical system comprising:
a focus lens for imaging the image of an object to be photographed at an imaging position, and
a light projecting lens for projecting a distance measuring light from a light source onto said object, a predetermined imaging plane of said light projecting lens being identical to that of said focus lens, and said light projection lens being arranged to move with said focus lens along an optical axis of said focus lens.

4,618,763

INFRARED FOCAL PLANE MODULE WITH STACKED IC MODULE BODY

Charles E. Schmitz, Irvine, Calif., assignor to Grumman Aerospace Corporation, Irvine, Calif.

Filed Apr. 12, 1985, Ser. No. 722,776
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—211 R **15 Claims**



1. An infrared focal plane module for interfacing a plurality of detector elements to external electronics comprising:
a plurality of multi-channel integrated circuits disposed in substantially overlapping registry to form a module body, each of said integrated circuits having exposed conductive areas formed along first and second edge portions thereof;
a detector array segment disposed transverse to the plane of said integrated circuits in abutting electrical connection to said integrated circuit first edge portions;
a module header interface for facilitating connections between said integrated circuits and external electronics, said interface being disposed transverse to the plane of said integrated circuits in abutting electrical connection to said integrated circuit second edge portions; and
adhesive insulating layers disposed between adjacent integrated circuits.

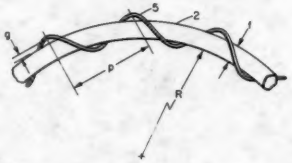
4,618,764
FIBER-OPTICAL PRESSURE DETECTOR

Alan L. Harmer, Plan-les-Ouates, Switzerland, assignor to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 450,809, Dec. 17, 1982, Pat. No. 4,572,950. This application Nov. 14, 1985, Ser. No. 797,740

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227 **5 Claims**



1. A device for the detection of pressure, comprising an optical fiber of a diameter f having at least one curve of a radius of curvature R, a light source juxtaposed with one end with said optical fiber for injecting a light beam into said optical fiber, a photodetector positioned to receive the light beam at an opposite end of said optical fiber so as to detect modification of said light beam representing pressure applied to said optical fiber between said ends, and a filament of a substantially incompressible material coiled around said optical fiber in a helix having a pitch p and with a mean spacing g between the helix and the optical fiber, said radius of curvature R being greater than a minimum defined by the relationship

$$R_{mm} = \frac{p^2}{2\pi^2} \cdot \frac{f}{g(f+g)}.$$

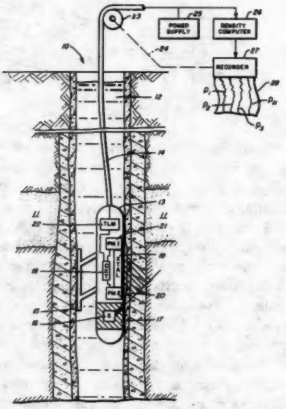
4,618,765
GAMMA RAY MEASUREMENT OF EARTH FORMATION PROPERTIES USING A POSITION SENSITIVE SCINTILLATION DETECTOR

Darrell S. Sonne, Katy, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Jan. 18, 1984, Ser. No. 571,973

Int. Cl.[4] G01V *5/00*

U.S. Cl. 250—269 **16 Claims**



1. A system for measuring properties of earth formations in the vicinity of a well borehole at a plurality of different radial distances from the borehole, comprising:

a fluid tight hollow body member sized and adapted for passage through a well borehole and housing therein;

a source of gamma rays and means for directing gamma rays from said source outwardly from said body member into earth formations in the vicinity of the borehole; and

a position sensitive scintillation detector for detecting gamma rays scattered back into said body member from the earth formation in the vicinity of the borehole, means for collimating said scattered gamma rays onto said detector, said detector comprising a scintillation crystal longitudinally spaced from said gamma ray source and having a longitudinal length L and two opposite ends and having photomultiplier tubes optically coupled to said opposite ends for providing output voltage signals having voltage amplitudes A and B representative of the intensity of scintillation events occurring in said crystal and impinging at said opposite ends thereof and means for combining said output voltage signals A and B according to a predetermined relationship to derive the position along said length L of each of said scintillation events in said crystal, thereby providing measurements of the gamma ray scattering properties of the earth formations at different radial distances from the borehole.

4,618,766
AUTOMATICALLY ADJUSTABLE ELECTRON MICROSCOPE

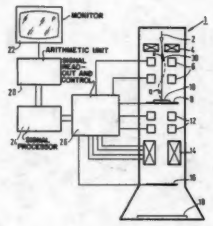
Karel D. van der Mast, Pynacker, and Ulrich Gross, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 608,599, May 9, 1984, abandoned. This application Sep. 9, 1985, Ser. No. 773,721

Claims priority, application Netherlands, Dec. 7, 1983, 8304217

Int. Cl.[4] G01N *23/04, 23/225*

U.S. Cl. 250—311 **13 Claims**

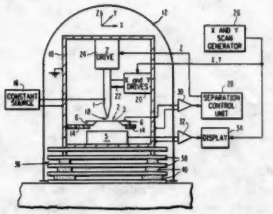


1. A method of optimally adjusting an image-correcting control variable in an electron microscope including an electron source, an illumination beam tilting device, an electron-optical lens system, and an electron detection device, characterized in that, using the illumination beam tilting device a specimen is irradiated in succession from different predetermined illumination angles, the image information thus provided being detected in the form of pixels and recorded in order to determine an optimum correction condition and, using an algorithm $F(s)=\Sigma(Xi-Yi+s)^*$, that value s of the image shift is determined for which the function F(s) is minimum, herein referred to as the s-value, where Xi and Yi are the intensity values of the compared pixels from images, resulting from corresponding successive tilt angles, i is the two-dimensional vector index which specifies the location of the image point at which the intensities Xi and Yi are compared, after which the corresponding image-correcting control variable is readjusted in dependence on the s-value thus determined, and * indicates the absolute value of the quantity or an even power thereof.

4,618,767
LOW-ENERGY SCANNING TRANSMISSION ELECTRON MICROSCOPE

David A. Smith, Katonah, and Oliver C. Wells, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 22, 1985, Ser. No. 715,139
Int. Cl.[4] H01J *37/26*
U.S. Cl. 250—311 **14 Claims**

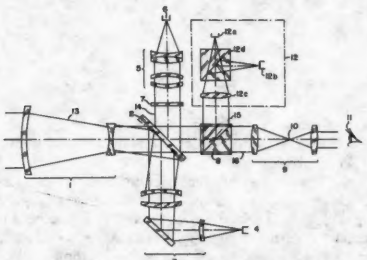


1. A low-energy scanning transmission electron microscope, comprising:
- a pointed electrode;
- a thin film sample spaced less than 100 nanometers from said electrode;
- means providing flow of low-energy electrons from said electrode to said spaced sample without focusing elements, some of the low-energy electrons passing through the sample;
- means for mechanically scanning said pointed electrode with respect to the sample; and
- electron sensing means for detecting low-energy electrons from said electrode which have passed through the sample.

4,618,768
THERMAL IMAGING DEVICE HAVING NON-ORTHOGONAL SCAN POSITION SENSOR TO SCANNING MIRROR BEAM PATH ANGLE

Wolfgang Weigel, Dossenheim, Fed. Rep. of Germany, assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 9, 1984, Ser. No. 670,438
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3341066
Int. Cl.[4] G02B *23/02*
U.S. Cl. 250—334 **17 Claims**



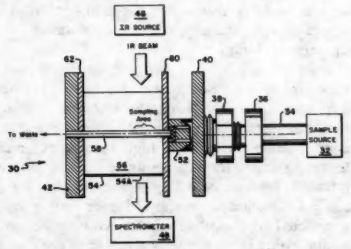
1. An improved thermal imaging device including:
- an infrared telescope for receiving an incident beam of radiation;
- a scanning mirror in optical alignment with said infrared telescope for directing said incident beam of radiation;
- said scanning mirror being disposed at a rest position which is inclined at an angle of 45 degrees to said incident beam of radiation;
- said scanning mirror further having a visual collimator side facing a beamsplitter and an imaging optical system including an eyepiece, both in optical alignment with said scanning mirror;
- an infrared objective in optical alignment with said scanning mirror;
- a detector array for receiving radiation which is optoelectronically converted and then represented by a corresponding light emitting diode array in optical alignment with said scanning mirror;
- said light emitting diode array being capable of emitting a plurality of l.e.d. output light beams that are
  - collected by an objective,
  - directed onto said visual collimator side of said scanning mirror, and
  - transmitted through said dichroic beamsplitter to said eyepiece; and
  - a scan position sensor including:
  - a light source for irradiating said visual collimator side of said scanning mirror and
  - a scan position sensor detector for sensing radiation and for generating a trigger signal when said detector senses radiation;

the improvement comprising:
- said light emitting diode array being capable of emitting said plurality of l.e.d. output light beams that are further
  - passed through an l.e.d. collimator objective and a plane plate and are also
  - directed to impinge upon said visual collimator side of said scanning mirror;
- said light source within said scan position sensor further being capable of also irradiating said plane plate through said beamsplitter; and
- said plane plate being disposed to reflect a plurality of beams of incident radiation through said beamsplitter in order to conduct said plurality of beams of incident radiation to said scan position sensor detector of said scan position sensor.

4,618,769
LIQUID CHROMATOGRAPHY/FOURIER TRANSFORM IR SPECTROMETRY INTERFACE FLOW CELL

Charles C. Johnson, Fairfield, Ohio, and Larry T. Taylor, Blacksburg, Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 4, 1985, Ser. No. 689,104
Int. Cl.[4] G01J *1/00*; G01N *1/10*
U.S. Cl. 250—338 **12 Claims**



1. In a Fourier transform infrared spectrometer wherein a sample material is isolated by liquid chromatography and directed through an elongated tube of small inner diameter for irradiation by an infrared beam in obtaining an infrared spectrum of the sample material representing the composition thereof, a sample flow cell comprising:

a generally cylindrical crystal having a longitudinal axis and a generally circular cross-section, wherein said crystal is transparent to infrared radiation and is positioned in line with the infrared beam with its longitudinal axis aligned generally perpendicular to the infrared beam, whereby said infrared beam is incident upon said crystal and is focused generally on the crystal's longitudinal axis and is transmitted therethrough so as to exit therefrom; and

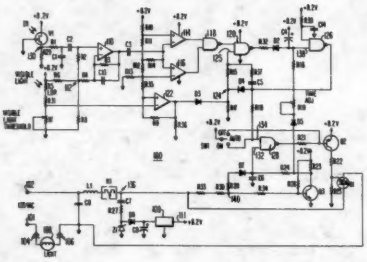
a small diameter, linear bore having a circular cross-section positioned within said crystal along the longitudinal axis and extending the length thereof and oriented generally perpendicular to the direction of propagation of the infrared beam therein, said bore coupled to the elongated tube for receiving and directing the sample material in the path of the infrared beam wherein the exiting infrared beam includes the infrared spectrum of the sample material.

4,618,770

ELECTRICAL CONTROLLER HAVING A WINDOW DISCRIMINATOR

Donald W. Maile, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 21, 1985, Ser. No. 714,510
Int. Cl.[4] G08B *13/18*; G01J *5/10*
U.S. Cl. 250—338 **3 Claims**



1. In a device for controlling the flow of electricity wherein the device includes means for detecting infrared radiation within a given area, the improvement comprising of a window discriminator including:

a voltage divider having three nodes for providing three different voltage potentials, said potentials being relatively and respectively high, intermediate and low;

a first comparator having a noninverting input terminal connected to the node of high voltage potential and an inverting input terminal coupled to the output of said infrared radiation detecting means;

a second comparator having an inverting input terminal connected to the node of low voltage potential and a noninverting input terminal coupled to the output of said infrared radiation detecting means;

means for coupling the node of intermediate potential to both the inverting input terminal of the first comparator and the noninverting input terminal of the second comparator; and

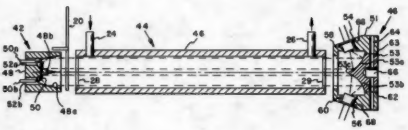
means responsive to the outputs of the comparators for actuating the control of electricity.

4,618,771

NON-DISPERSIVE INFRARED ANALYZER HAVING IMPROVED INFRARED SOURCE AND DETECTING ASSEMBLIES

Carl A. Farren, Placentia, Calif., assignor to Beckman Industrial Corporation, Fullerton, Calif.

Filed Nov. 14, 1983, Ser. No. 551,454
Int. Cl.[4] G01J *1/00*
U.S. Cl. 250—343 **27 Claims**



1. An infrared analyzer comprising:

(a) a sample cell for conducting a flow of a sample gas, said cell comprising a chamber within which the sample gas may be illuminated by a beam of infrared radiation,

(b) an infrared source assembly including:

(i) a reflecting element, said reflecting element having a reflecting surface which lies in the surface of revolution formed by the rotation of a concave figure about an axis that is offset from the axis of the sample cell, and

(ii) an approximately circular heating element mounted approximately at the focal region of the reflecting surface,

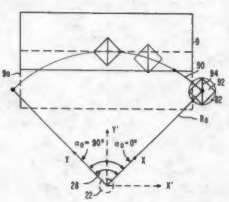
(c) an infrared detecting assembly for receiving infrared radiation from the source assembly, through the sample cell, and converting said radiation into an electrical signal indicative of the composition of the sample gas.

4,618,772

NUCLEAR IMAGING APPARATUS

Werner J. Haas, Uttenreuth, Fed. Rep. of Germany, and Rainer L. Haerten, Long Grove, Ill., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 381,143, May 24, 1982, abandoned. This application Jan. 22, 1985, Ser. No. 693,493
Int. Cl.[4] G01T *1/166*
U.S. Cl. 250—363 S **13 Claims**



1. A nuclear imaging apparatus for producing images of an object under examination which emits nuclear radiation, comprising in combination

(a) a scintillation camera for receiving said radiation and for determining the locations of scintillation events generated by said nuclear radiation, said scintillation camera issuing x and y coordinate signals corresponding to said locations and issuing z unblank signals corresponding to the intensity of said scintillation events;

(b) display means having a screen for displaying image points under the control of said z unblank signals on screen locations determined by said x and y coordinate signals;

(c) means for generating a relative movement between said scintillation camera and said object along a first and a second arc-shaped scanning path;

(d) transferring means generating a shift movement between said object and said scintillation camera from a first pass position to a second pass position along a linear shift direction, each of said first and second pass positions being associated with said first and second scanning paths, respectively; and

(e) electronic means for enclosing a square field of view when said imaging points are displayed on said display means, said electronic means being fed by said x and y coordinate signals and supplying the input of said display means with input signals such that said square field of view maintains a fixed angular orientation with respect to a fixed coordinate system during each of said passes.

4,618,773

APPARATUS FOR THE DIAGNOSIS OF BODY STRUCTURES INTO WHICH A GAMMAEMITTING RADIOACTIVE ISOTOPE HAS BEEN INTRODUCED

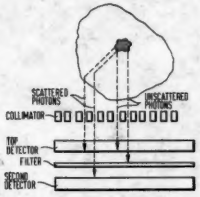
Andrej K. Drukier, c/o H. Hessel, 532 W. 111th Apt. 76, New York, N.Y. 10025

Filed Oct. 4, 1983, Ser. No. 538,794

Claims priority, application United Kingdom, Oct. 4, 1982, 8228232

Int. Cl.[4] G01T *1/164*

U.S. Cl. 250—363 S 14 Claims



1. Apparatus for the diagnosis of body structures into which an essentially monochromatic gamma-emitting radioactive isotope has been introduce, wherein said gamma-emitting radioactive isotope emits gamma photons at a specific energy and wherein some of said gamma photons lose energy due to Compton scattering in said body structures so that on emerging from said body structures they have second energies below said specific energy, the apparatus comprising, in sequence, a collimator through which photons emanating from the body structure being studied are directed; a first position sensitive photon detector, said first photon detector being adapted to absorb a fraction lying between 10 and 50% of both the scattered and non-scattered photons incident thereon; a filter comprising an element with an atomic number not less than 74 and having an absorption edge at an energy just below said specific energy but above said second energies, whereby said filter preferentially absorbs photons emanating from but not scattered within said body structures and preferentially transmits scattered photons; a second position sensitive photon detector positioned after said filter in line with said body structures, said first detector and said filter for detecting scattered photons passing through said filter and analysing means for producing an image due to non-scattered photons from the image of scattered photons formed by the second detector and the image of scattered and non-scattered photons formed by the first detector.

4,618,774

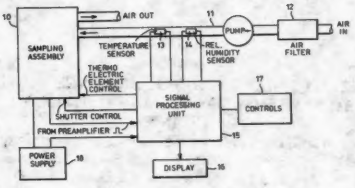
INSTRUMENT FOR MEASURING LEVELS OF CONCENTRATION OF TRITIUM AND TRITIUM OXIDES IN AIR

Marcel Hascal, 1 Boldmere Crescent, Willowdale, Ontario, Canada (M2J 2R8); Adrian Mihai, 181 Robert Hicks Dr., Willowdale, Ontario, Canada (M2R 3R3), and Robert C. Hanrahan, 302 Woodbine Ave., Toronto, Ontario, Canada (M4L 3P4)

Filed Aug. 13, 1984, Ser. No. 639,798

Int. Cl.[4] G01T *1/20, 7/02*

U.S. Cl. 250—364 17 Claims



1. An instrument for measuring levels of concentration of tritium oxides and/or elemental tritium in air, comprising:

an instrument housing providing an inlet and an outlet for air to be monitored,

a light sensing device mounted therein, the light sensing device having a window,

circuit means connected to the light sensing device for deriving output signals therefrom proportional to the light sensed,

a thermally conductive mounting block having a mounting surface spaced from the window for mounting a scintillator in viewing relationship thereto,

means for flowing air to be monitored through the space between the mounting surface and the window,

means for selectively cooling and warming the mounting block for condensing air moisture onto the scintillator and evaporating condensed moisture therefrom, and

means for selectively exposing the scintillator to the window for timed durations.

4,618,775

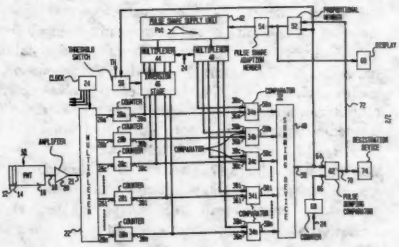
RADIATION DETECTOR CIRCUIT WITH REAL TIME PHOTON COUNTING

Dennis E. Persyk, Barrington, and Everett W. Stoub, Villa Park, both of Ill., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Mar. 26, 1984, Ser. No. 593,020

Int. Cl.[4] G01T *1/208*

U.S. Cl. 250—369 12 Claims



1. A radiation detector circuit, comprising:

(a) a radiation detector containing

(a1) a scintillation crystal; and

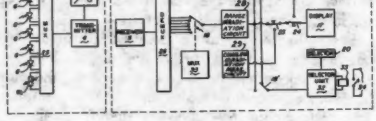
(a2) a photomultiplier tube of a type adapted for real time photon measurement and having a pulse output;
(b) a plurality of pulse counters each having a pulse input and a count signal output;
(c) a time multiplexer means between the pulse output of the photomultiplier tube and the pulse inputs of the pulse counters for connecting each pulse input of each counter in succeeding time periods with the pulse output of the photomultiplier tube; and
(d) an evaluation circuit means connected with the count signal outputs of the counters for evaluating each count signal of each counter measured during each of said succeeding tim eperiods.

4,618,776

LIGHT AND WEATHER RESISTANCE SENSING SYSTEM WITH A SENSED SIGNAL TRANSMISSION CHANNEL

Walter Stürm, Hanau; Helmut Becker, Limeshain; Jürgen Witt, Hainburg; Werner Fritz, Steinau-Sarrod, and Ursula Eysholdt, Hanau, all of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Mar. 9, 1984, Ser. No. 587,500
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310631
Int. Cl.[4] G01J *3/36;* G01N *17/00*
U.S. Cl. 250—372 **4 Claims**



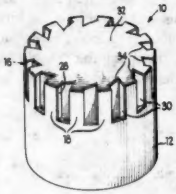
1. Apparatus for testing the resistance of samples of various materials to light and weathering, comprising
a sample testing chamber (10) defined by a housing wall (8),
lamps (2) disposed in said chamber and simulating the effect, on samples, of radiation, including sunlight, said samples being rotatably arranged in a plane in said chamber,
a sensor (15) disposed in the plane of, and rotatable with, said samples,
said sensor (15) having multiple receptor cells (6) producing a plurality of respective output signals,
each cell being responsive to a particular spectral range of radiation and generating signals corresponding to the irradiance (mW/sq.cm.) and irradiation (Ws/sq.cm.) incident upon it, and having a respective output;
means (4), rotatable with said sensor (15), transmitting the output signals from the sensor, serially, to a stationary radio receiver (5) external to said rotatable sensor, said means including a single multiplexer (25) and a single radio transmitter (4), said multiplexer (25) having an input connected to each receptor cell output and an output connected to said radio transmitter (4);
a plurality of solar cells (7) arranged on said sensor (15) and generating, from radiation received from said sunlight-simulating lamps (2), all electrical power necessary for operation of said receptor cells (6) and transmitting means (4);
said stationary radio receiver (5), including an antenna (3) projecting from said housing wall (8) into said chamber (10), receiving said signals and directing them to a de-multiplexer (26) for subsequent processing and display.

4,618,777

OUTER ELECTRODE WITH IMPROVED SMOKE ENTRY

George A. Schoenfelder, Downers Grove; Stephen L. Siegel, Hanover Park, and James S. Slater, Batavia, all of Ill., assignors to Pittway Corporation, Aurora, Ill.

Filed Nov. 19, 1984, Ser. No. 673,110
Int. Cl.[4] G01T *1/185*
U.S. Cl. 250—381 **1 Claim**



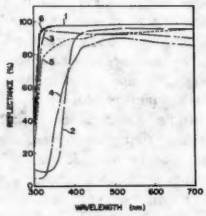
1. An outer electrode for a combustion products detector comprising a cylindrical base portion; a cylindrical vent portion integral with said base portion; and a top wall integral with said vent portion; said vent portion including a plurality of alternating inner and outer slats forming entry slots allowing the introduction of ambient air and products of combustion, said outer slats being segments of a first surface of revolution having a first diameter, said inner slats being skewed between second and third surfaces of revolution having a second and third diameters, respectively, and a plurality of inner walls joining said inner slats to said base and sloping radially inwardly and away from said top wall.

4,618,778

RADIOGRAPHIC INTENSIFYING SCREEN

Akira Kitada, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Jun. 6, 1984, Ser. No. 617,978
Claims priority, application Japan, Jun. 7, 1983, 58-100184
Int. Cl.[4] G01J *1/58;* G01N *21/64;* G01T *1/00*
U.S. Cl. 250—483.1 **6 Claims**

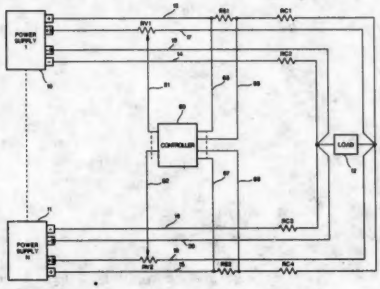


1. A radiographic intensifying screen comprising a support, a phosphor layer which comprises a binder and a phosphor dispersed therein, and a light-reflecting layer provided between the support and the phosphor layer which contains a white pigment, characterized in that said white pigment comprises alkaline earth metal fluorohalide represented by the formula $M^{II}FX$, in which M^{II} is at least one alkaline earth metal selected from the group consisting of Ba, Sr and Ca; and X is at least one halogen selected from the group consisting of Cl and Br.

4,618,779
SYSTEM FOR PARALLEL POWER SUPPLIES

Nathan Wiscombe, Broomfield, Colo., assignor to Storage Technology Partners, Louisville, Colo.

Filed Jun. 22, 1984, Ser. No. 623,646
Int. Cl.[4] H02J 1/10
U.S. Cl. 307—60 12 Claims



1. A system for connecting a plurality of power supplies in parallel, each of said power supplies having an output terminal for connecting a power line between the output terminal and a common load, and a sense terminal for connecting a sense line between the sense terminal and the common load, each of said power supplies having control means therewithin for adjusting the power delivered to said common load over said power line in response to a sense signal appearing at said sense terminal, said system comprising:

means for sensing the current delivered to the load through the power line of each of said power supplies;

means for comparing the current sensed by said sensing means against a desired shared current value, and for generating a control signal representative of said comparison; and

means responsive to said control signal for varying said sense signal appearing at the same terminal of each of said power supplies in a manner that causes the current delivered by that power supply to the load to approach said desired current value, wherein said means for varying the sense signal appearing at the sense terminal comprises a variable impedance element inserted into the sense line of each power supply, said variable impedance element having an impedance that varies as a function of a signal applied to a control terminal thereof, said control signal generated by said comparison means being coupled to the control terminal of said variable impedance element.

4,618,780
POWER-OFF DETECTION CIRCUIT FOR AN ELECTRONIC APPARATUS

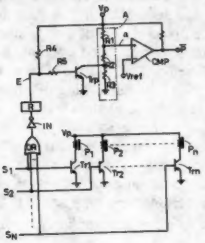
Keiichi Ikoma, Nara, and Syuji Katayama, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 25, 1984, Ser. No. 573,645
Claims priority, application Japan, Feb. 8, 1983, 58-18834[U]
Int. Cl.[4] G01R 17/02
U.S. Cl. 307—130 14 Claims

1. Power-off detection means for use in an electronic apparatus having a power supply developing a supply voltage and at least one heavy load selectively connectable to said power supply in response to the generation of a control signal, said means comprising:

means, responsive to said supply voltage, for determining whether said supply voltage drops below a reference level to thereby indicate that said power supply has been disconnected and for producing a power-off signal indicative thereof;

means, responsive to generation of said control signal, for raising said reference level of said means for determining

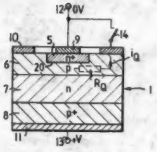


for a period of time so as to prevent said power-off signal from erroneously indicating a power-off condition when said heavy load is initially connected to said power supply.

4,618,781
GATE TURN-OFF THYRISTOR CONSTRUCTION

Dieter Silber, Hausen; Friedhelm Sawitzki, Frankfurt am Main, and Kurt Roy, Götzenhain, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Fed. Rep. of Germany

Continuation of Ser. No. 46,935, Jun. 8, 1979, abandoned. This application Mar. 20, 1981, Ser. No. 246,019
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1978, 2825794
Int. Cl.[4] H03K 17/60
U.S. Cl. 307—252 C 5 Claims



1. A gate turn-off thyristor with low control power consumption comprising:

a first emitter layer (8) of one conductivity type;

a main base layer (7) of another conductivity type connected to said first emitter layer;

a control base layer (6) of said one conductivity type connected to said main base layer;

a second emitter layer (5) of said other conductivity type connected to said control base layer at a junction (20) therebetween which surrounds a portion of said second emitter layer;

a second emitter contact (9) connected to said second emitter layer;

a control base contact (10) connected to said control base layer and having an opening with a geometric shape that has a center, said opening having a boundary surrounding and spaced from said second emitter contact and said junction;

a first emitter contact (11) connected to said first emitter layer;

biasing means (12,13) connected to said contacts for applying a turn-off current to said control base contact;

said control base layer having a lateral shunt resistance (R_Q)

between said junction (20) and said control base contact (10); and

means (14,14') for turning said turn-off thyristor off by a short circuiting of said control base contact (10) with said second emitter contact (9), connected between said control base and second emitter contacts;

the surface resistance (ρ_S) of said control base layer (6) between said center and said control base contact boundary being selected so that, with a control base turn-off current which is sufficient for turning off the thyristor, a potential appears on said lateral shunt resistance (R_Q) which is less than that appearing at said junction (20) whereby the difference between said potentials is used as an additional driving potential for a carrier current flowing over said lateral resistance and said control base contact by said means for turning said gate turn-off thyristor off.

4,618,782

TRANSISTOR POWER AMPLIFIER HAVING REDUCED SWITCHING TIMES

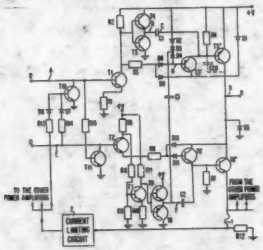
Albrecht Lang, Leinfelden-Echterdingen, and Walter H. Sakmann, Nufringen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 5, 1983, Ser. No. 520,410

Claims priority, application European Pat. Off., Aug. 25, 1982, 82107773.2

Int. Cl.⁴ H03K *17/60, 3/01, 3/33*

U.S. Cl. 307—255 **5 Claims**



1. A transistor power amplifier having short switching times comprising:

an input terminal;

an output terminal;

an input stage provided with an input bipolar transistor having the base thereof connected to said input terminal, collector thereof connected to a positive voltage source and emitter thereof connected to a negative voltage source maintained at a reference potential;

an output stage provided with first and second output bipolar transistors interconnected in Darlington circuit configuration including the emitter of said first output transistor connected to said positive voltage source, the collector of said first output transistor connected to said output terminal, the base of said first output transistor connected to the emitter of said second output transistor, the base of said second output transistor connected, via a first diode, to the collector of said input transistor and the collector of said second output transistor connected, via a second diode, to said positive voltage source and, via a third diode, to the collector of said input transistor; and

a pair of complementary bipolar transistors having their bases interconnected and their emitters interconnected, said interconnected bases being connected to the collector of said input transistor, said interconnected emitters being connected, via a capacitor, to the base of said first output transistor and the collectors of said complementary transistors being connected to said positive and negative voltage sources, respectively.

4,618,783

PRODUCTION OF SHORT LIGHT PULSES BY TIME COMPRESSION

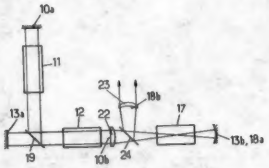
Francois Pradere, Soisy Sous Montmorency, and Robert Frey, Paris, both of France, assignors to Centre National de la Rechereche Scientifique, Paris, France

Filed Apr. 23, 1984, Ser. No. 602,675

Claims priority, application France, Oct. 6, 1983, 83 15913

Int. Cl.⁴ H03F *7/00*

U.S. Cl. 307—426 **15 Claims**



1. A method for generating mono-pulses of light by time compression of laser energy, comprising: providing a Raman medium in a low Q energy storage cavity having low losses for light at a predetermined frequency; storing energy delivered by a laser at said predetermined frequency in said storage cavity; locating said Raman medium in a Stokes cavity having a high gain at a Stokes frequency; and extracting the stored energy at said Stokes frequency, whereby most of the stored energy is extracted by a single to and fro travel through the Stokes cavity.

4,618,784

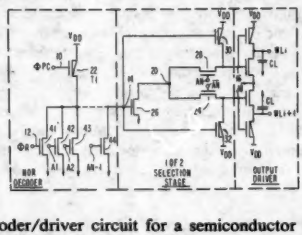
HIGH-PERFORMANCE, HIGH-DENSITY CMOS DECODER/DRIVER CIRCUIT

Barbara A. Chappell, Amawalk; Thekkemadathil V. Rajeevakumar, Scarsdale; Stanley E. Schuster, Granite Springs, and Lewis M. Terman, South Salem, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1985, Ser. No. 695,664

Int. Cl.⁴ H03K *19/096, 19/20, 19/017;* **G11C** *8/00*

U.S. Cl. 307—449 **11 Claims**



1. A decoder/driver circuit for a semiconductor memory comprising:

a NOR decoder means connected to true and complement lines of a plurality of A1 to AN−1 memory address bits for receiving said memory address bit signals thereon,

said NOR decoder means further including a first output node having a high signal condition thereon when all said plurality of designated address bit signals A1 to AN−1 coupled thereto are at a low signal condition and having a low signal condition thereon when any of said plurality of designated address bit signals A1 to AN−1 have a high signal condition,

an output word line driver means coupled to a first memory work line and a second memory work line,

a selection means coupled to said first node of said NOR decoder means and the input of said output word line driver means, said selection means being also coupled to the true and complement lines of an AN memory address

bit signal, said selection means being responsive to high signal condition on said NOR decoder first node and a high signal condition on said true line of said AN address bit signal for producing a high signal condition on said first memory work line and a low signal condition on said second memory work line, said selection means being also responsive to a high signal condition on said NOR decoder first node and a high signal condition on said complement line of said AN address bit signal for producing a high signal condition on said second memory work line and a low signal condition on said first memory work line,

wherein said selection means includes a first transistor switching device having a gate coupled to said true line of said AN address bit signal and a second transistor switching device having a gate coupled to said complement line of said AN address bit signal,

a third transistor switching device having a gate coupled to said first node of said NOR decoder means, said third transistor switching device being coupled to and forming a conduction path between first and second transistors and voltage ground when said third transistor is switched on in response to a high signal condition on said NOR decode first node,

wherein a high signal condition on said true line coupled to said first transistor and a high signal condition on said NOR decoder first node coupled to said third transistor forms a conduction path for producing said high signal condition on said first word line, and

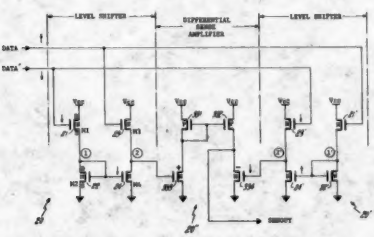
wherein a high signal condition on said complement line connected to said second transistor and a high signal condition on said NOR decoder first node forms a conduction path for producting said high signal condition on said second word line.

4,618,785

CMOS SENSE AMPLIFIER WITH LEVEL SHIFTER

Hiep van Tran, Carrollton, Tex., assignor to Thomson Components - Mostek Corporation, Carrollton, Tex.

Filed Sep. 6, 1984, Ser. No. 648,091
Int. Cl.[4] H03K *5/24*; G11C *7/06*
U.S. Cl. 307—530 **3 Claims**



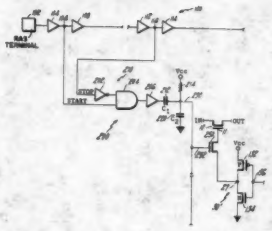
1. A sense amplifier for a CMOS static RAM which has a pair of complementary data outputs comprising a CMOS differential amplifier including first and second inputs and an output, first and second level shifters, the first connected between one data output and the first differential amplifier input and the second connected between the other data output and the second differential input, each level shifter comprising two pairs of series-connected MOS transistors, the differential amplifier comprising two pairs of complementary transistors, the level shifters being operatively connected to lower the voltage levels applied to the inputs of the differential amlifier below the levels of the data outputs.

4,618,786

PRECHARGE CIRCUIT FOR ENHANCEMENT MODE MEMORY CIRCUITS

Mark G. Johnson, Sunnyvale, Calif., assignor to Thomson Components - Mostek Corporation, Carrollton, Tex.

Filed Aug. 13, 1984, Ser. No. 640,276
Int. Cl.[4] H03K *17/06, 19/096*
U.S. Cl. 307—578 **3 Claims**



1. A field-effect transistor circuit, employing only enhancement transistors, for controlling the passage of at least one controlled signal, after a first predetermined relative time, from an input terminal to an output terminal comprising:

at least one pass transistor having a pass transistor gate, an input node and an output node respectively connected to said input terminal and an output terminal, for passing to said input terminal to said output terminal;

receiving means for receiving a cycle-initiating signal;

pulse-forming means, responsive to said receiving means, for forming a precharge pulse signal having a predetermined duration and a precharge voltage magnitude greater than a power supply voltage magnitude, said precharge pulse signal reaching said precharge voltage magnitude said first predetermined relative time after said cycle-initiating signal;

distributing means for distributing said precharge pulse signal to at least one gate control means for controlling the voltage on said pass transistor gate in response to said precharge pulse signal, said gate control means including means for forming an electrical path, for raising said pass transistor gate to said power supply voltage magnitude, between a switching node and said pass transistor gate; and

controllable current means, connected to said switching node, for supplying current at a voltage substantially equal to said supply voltage to said switching node at said predetermined relative time after said cycle-initiating signal has been received by said receiving means, whereby said pass transistor gate is brought substantially to said power supply voltage, and also for establishing a path from said pass transistor gate to ground at a second predetermined relative time after said first predetermined relative time.

4,618,787

ADJUSTABLE TIME DELAY CIRCUIT

Barry H. Jacksier, Wheeling, and Gary B. Ollendick, Mundelein, both of Ill., assignors to AT&T Teletype Corporation, Skokie, Ill.

Filed Dec. 9, 1983, Ser. No. 559,619
Int. Cl.[4] H03K *5/13*
U.S. Cl. 307—591 **10 Claims**

1. An adjustable time delay circuit (10) which includes an adjustment feature compensating for environmental influences comprising:

an input terminal (14);

an output terminal (41);

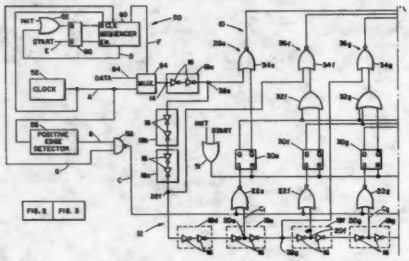
a plurality of serially connected time delay elements (16)

forming a tapped time delay line (12), said time delay line having one end thereof connected to the input terminal;

first means (52) for generating first signal (A), said first signal being fed to the input terminal of said time delay line (12);

second means (56) for generating second signal (C) in response to said first signal;

third means (22*e–m*) responsive to said first signal at a plurality of selected locations along said time delay line (12) and



responsive to said second signal for providing one of a plurality of possible control signals in response to a predetermined relationship between said first (A) and second (C) signals; and

a plurality of signal activated switches (36*e–m*), each switch being responsive to a corresponding one of said control signals for connecting a selected tap (38*e–m*) of said time delay line (12) to said output terminal (41).

4,618,788

INTEGRATED DELAY CIRCUIT FOR DIGITAL SIGNALS

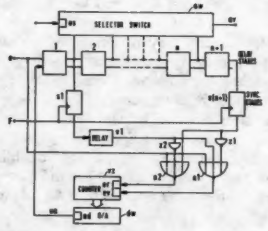
Reiner Backes, and Ulrich Langenkamp, both of Freiburg, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Feb. 15, 1984, Ser. No. 580,512

Claims priority, application European Pat. Off., Feb. 17, 1983, 83101491; Apr. 20, 1983, 83103820

Int. Cl.[4] H03K *5/13*; H03L *7/00*

U.S. Cl. 307—603 **18 Claims**



1. An integrated delay circuit for digital signals said circuit providing a delay adjustable in n equal steps comprising:

an input terminal for receiving said digital signals;

an output terminal;

n+1 cascaded delay stages coupled at one end of said input terminal, each of said delay stages comprising a control terminal, first and second cascaded inverters, an integrated capacitor having one terminal coupled to the output of said first inverter, a transfer transistor having a gate coupled to a control terminal and via its channel coupling the other terminal of said capacitor to ground, the delay time of said delay stage being adjusted by the potential at said control terminal;

a one-out-of-n selector switch for selecting the delay between said input and said output terminal and having n inputs coupled respectively to the outputs of n of said delay stages and having an output coupled to said output terminal;

a clock terminal receiving clock signals having a frequency fc where fc=1/nt and t is the delay provided by n of said n+1 cascaded delay stages;

a first clock synchronizing stage having a first input coupled to said clock terminal, a second input coupled to the output of a first delay stage of said n+1 cascaded delay stages, a first synchronizing output, and providing signals from the output of said first delay stage synchronized to said clock signals at said first synchronized output;

a second clock synchronizing stage having a first input coupled to said clock terminal, a second input coupled to the output of the last delay stage of said n+1 cascaded delay stages, a second synchronizing output, and providing signals from the output of said last delay stage synchronized to said clock signals at said second synchronizing output;

a delay circuit having an input coupled said first synchronizing output for delaying the output thereof by one period of said clock signals;

first and second combinational logic circuits each coupled to the output of said delay circuit, said second synchronizing output, and said input terminal for providing first and second control signals;

an up/down count having an up input responsive to said first control signal and a down input responsive to said second control signal, and a plurality of count output terminals;

a digital to analog converter having a plurality of input terminals each coupled to one of said plurality of count output terminals and having an analog output terminal coupled to said control terminal of all of said n+1 cascaded stages.

4,618,789

LINEAR MOTOR FOR THE HIGH-SPEED RECIPROCATING MOVEMENT OF A ROTOR SLIDE POSSESSING MASS

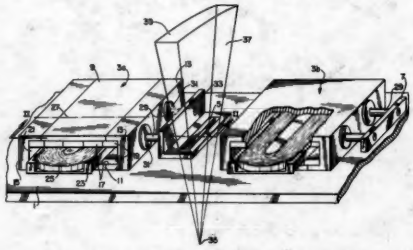
Peter Flisikowski, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 12, 1984, Ser. No. 630,474

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1983, 3326238

Int. Cl.[4] H02K *41/02*

U.S. Cl. 310—13 **9 Claims**



1. A linear motor for high-speed reciprocation of a slide having a substantial mass, comprising

first and second mutually parallel flat stator plates, each of said plates having a respective facing side facing the other plate,

at least one flat permanent magnet disposed on one of said facing sides and defining an air gap, said magnet creating a magnetic field in said air gap, substantially perpendicular to said facing sides,

a slide member disposed in said air gap and mounted for

linear motion with respect to said stator in a given direction substantially parallel to said stator plates, and

a coil carried on said slide member, movable by said slide member in said magnetic field,

characterized in that said coil is spiral wound from an aluminum film having a surface insulating layer, the axis of said spiral being perpendicular to the direction of movement of the slide and parallel to the direction of the magnetic field, and

said motor comprises first and second bridges extending between said fist and second stator plates at opposite ends of the plates in the direction of slide movement, and gas bearings formed in respective bridges, said slide being positioned transversely of the direction of movement by said gas bearings.

4,618,790

AXIAL AIR GAP MOTOR

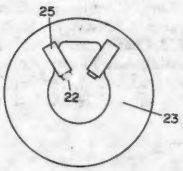
Yoshitaka Kakuda, Takefu, and Norimasa Kondoh, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 13, 1985, Ser. No. 765,197

Claims priority, application Japan, Aug. 16, 1984, 59-170640; Aug. 16, 1984, 59-170641

Int. Cl.[4] H02K *5/16*

U.S. Cl. 310—90 **6 Claims**



1. An aixal air gap motor comprising a coreless armature having a plurality of coils in planar form set in resin, and fixed on a shaft, a bracket including a permanent magnet opposed to said armature through an axial air gap, a planar portion having said permanent magnet fixed thereto, a cylindrical oil receiving and holding portion continuous with the radially inner side of said planar portion and projecting axially outward, and a cylindrical bearing holding portion continuous with said oil receiving and holding portion and projecting axially inward, a magnetic path plate opposed to that planar surface of the armature which faces away from said permanent magnet, with an air gap defined between said magnetic path plate and said planar surface, said magnetic path plate being fixed around its outer periphery to said bracket, a sleeve bearing fixed to the bearing holding portion of said bracket with its opposite ends exposed outside said bearing holding portion, said sleeve bearing cantilever-wise supporting said shaft for rotation therein, oil storage members positioned on the inner and outer surfaces of said bracket to surround at least a portion of said sleeve bearing and serving to feed lubricating oil to said sleeve bearing, an end cover attached to the outer side of said oil receiving and holding portion and adapted to hold said oil storage member positioned on the outer side of said bracket, a bearing cover attached to the inner side of said oil receiving and holding portion and adapted to hold said oil storage member positioned on the inner side of said bracket, an oil thrower secured to said shaft with its front end positioned inwardly of said end cover, said oil thrower ensuring that lubricating oil leaking from the portion of said sleeve bearing which is exposed outside said bracket is returned to the oil storage member which is positioned on the outer side of said bracket, and a second oil thrower secured to the shaft between the end surface of said sleeve bearing positioned inside said bracket and said armature, the front end of said second oil thrower being positioned between said bearing cover and said sleeve bearing.

4,618,791

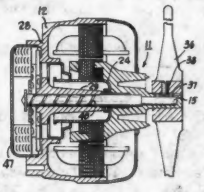
ROTOR ASSEMBLY WITH DIE CAST SHAFT EXTENSION COUPLING

Giles W. Morrill, Rocky Fork, and Stephen G. Rice, Rt. 2, Box 505, both of Erwin, Tenn. 37650

Filed Oct. 17, 1985, Ser. No. 788,333

Int. Cl.[4] H02K *3/06, 5/16*

U.S. Cl. 310—90 **18 Claims**



1. A rotor assembly for an alternating current motor having a stator, said rotor assembly comprising:

a magnetically permeable rotor mass having apertures and a rotational axis;

a die cast squirrel cage extending through said apertures in said rotor mass;

an integral die cast extension on said rotor mass coaxially on one end thereof;

a journal portion on said rotor assembly for journaling said rotor assembly relative to a stationary bearing; and

said integral die cast extension adapted to be connected to a load to transmit torque thereto.

4,618,792

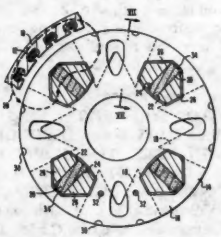
DYNAMOELECTRIC MACHINE WITH A LAMINATED POLE PERMANENT MAGNET ROTOR

William W. Yates, Lima, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 26, 1984, Ser. No. 654,627

Int. Cl.[4] H02K *21/12*

U.S. Cl. 310—156 **8 Claims**



1. A dynamoelectric machine comprising:

a stator assembly;

a rotor mounted for rotation within said stator assembly;

said rotor comprising a laminated core having a central portion including a plurality of non-magnetic structural laminations and a plurality of magnetic laminations interspersed among said non-magnetic structural laminations, and said core having two end portions each having a plurality of said non-magnetic structural laminations positioned adjacent to each other;

a plurality of permanent magnets extending longitudinally within said core, each of said permanent magnets having

pole faces oriented in planes which are substantially perpendicular to the circumferential direction;

a plurality of magnetic pole pieces extending longitudinally within said core, each of said magnetic pole pieces lying adjacent to one of said pole faces of each of said permanent magnets and extending circumferentially from the associated major surface to an edge of adjacent ones of said magnetic laminations to produce a plurality of magnetic flux paths circumferentially disposed about the periphery of said core, wherein the cross-sectional area of each of said pole pieces in a plane perpendicular to the rotor axis is substantially constant within the central portion of said core and decreases as said pole pieces extend from said central portion into the end portions of said core; and

means for securing said laminations into a unit.

4,618,793

ROTOR FOR ALTERNATORS WITH MOLDED SLIPRING ASSEMBLY

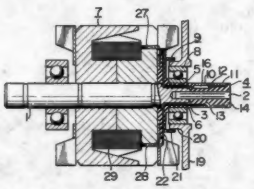
Masayuki Shizuka, and Shigeki Yamada, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 21, 1985, Ser. No. 714,473

Claims priority, application Japan, Mar. 23, 1984, 59-54491

Int. Cl.[4] H02K *13/02*; H01R *39/08*

U.S. Cl. 310—232 **6 Claims**



1. A rotor for alternators comprising: a rotor shaft integral on the center of a rotary magnetic pole assembly having a field coil wound thereon; an axial hole in a central portion of one end surface of said rotor shaft and extending inwardly of the rotor shaft therefrom and receiving a slip ring supporting shaft; and a slip ring assembly including a plurality of slip rings, conductor wires leading from said slip rings, respectively, and said slip ring supporting shaft, said slip rings, said conductor wires and said slip ring supporting shaft being molded in one body with an insulating material, said slip ring assembly being fixed to said rotor shaft with said slip ring supporting shaft press-fitted in said axial hole of said rotor shaft.

4,618,794

ELECTRIC MOTOR FOR DRIVING ELEMENTS OF MOTOR VEHICLES IN TWO OPPOSITE DIRECTIONS WITH A HIGHER RESISTING FORCE IN ONE DIRECTION THAN IN THE OTHER, SUCH AS WINDOW RAISERS OR PIVOTAL SEAT BACKS

Marc Rampignon, Villemomble, France, assignor to Compagnie Industrielle de Mecanismes en agrege C.I.M., France

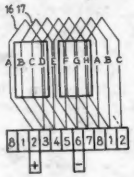
Filed Mar. 25, 1985, Ser. No. 715,849

Claims priority, application France, Mar. 26, 1984, 84 04666

Int. Cl.[4] H02K *13/04*

U.S. Cl. 310—234 **2 Claims**

1. An electric motor of the type in which the speed of rotation as a function of the resisting torque is different in one direction of rotation than in an opposite direction, said motor comprising: (a) field poles; (b) a pair of brushes placed between the field poles; (c) an armature structure having an armature support defining a plurality of armature slots designated A, B, C, . . .; (d) a commutator connected to rotate with the armature support and having a series of commutator strips defining commutator slots therebetween; (e) a motor shaft extending through the armature support; and, (f) wires connecting said series of commutator strips wound in said armature slots, the brushes being cooperative with said armature structure, said wires connecting the commutator strips (1,2,3 . . .) and wound in said armature slots (A,B,C, . . .) being wound in accordance with the following progression: 2 - AD - 3 - BE - 4 - CF - 5 -



DG - 6 - EH - 7 - FA - 8 - GB - 1 - HC - 2 . . . so as to achieve an angular offset of a commutator strip (1,2,3 . . .) relative to a line through the field poles in the connection of the winding to the commutator in the direction of rotation of the armature structure.

4,618,795

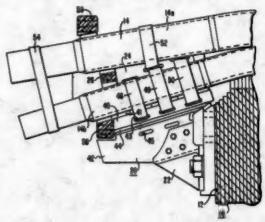
TURBINE GENERATOR STATOR END WINDING SUPPORT ASSEMBLY WITH DECOUPLING FROM THE CORE

Glenn D. Cooper; John M. Butler, III; Darrell R. Morrison, all of Orlando; Charles L. Senic; Lennart S. Nilsson, both of Winter Park, and Charles M. Rowe, Orlando, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 10, 1985, Ser. No. 721,618

Int. Cl.[4] H02K *3/46*

U.S. Cl. 310—260 **5 Claims**



1. A dynamoelectric machine comprising:

a stator with a core and a stator winding, said core having a generally cylindrical bore;

said stator winding including inner portions within slots in said core and end portions extending axially from each end of said core;

a support assembly for restraining said end portions of said stator winding, said support assembly comprising a brace and a bracket located at each of a plurality of spaced positions radially outside said end portions;

said bracket being fixedly secured to said core and to said brace;

said brace comprising a top rigid piece adjacent said end portions of said winding, a bottom rigid piece, radially outside said top piece, secured to said bracket, and an intermediate decoupler between said top and bottom pieces, said intermediate decoupler comprising an elastomer layer and a slip layer which together provide cushioning between said top and bottom pieces and low friction between said top and bottom pieces for permitting relative movement in an axial direction;

said brace bottom piece being a generally plate-like member having its major surfaces disposed in a radial plane with an

upper surface disposed transverse to said radial plane, said bottom piece extending axially over a substantial portion of said end portion of said winding;

said brace top piece being a generally plate-like member having a lower major surface disposed parallel to said upper surface of said bottom piece; and,

said elastomer layer and said slip layer are disposed between and parallel with said upper surface of said brace bottom piece and said lower major surface of said brace top piece.

4,618,796

ACOUSTIC DIODE

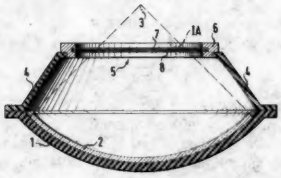
Rainer Riedlinger, Karlsruhe, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Oct. 2, 1985, Ser. No. 783,143

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1984, 3437488

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—311 **12 Claims**



1. Sonic transmitter comprising a source of sonic waves and a system for suppression of negative sound pulses, wherein there is positioned across the acoustic signal path of said sonic wave source an acoustic discriminator comprising at least two peripherally secured foils normally in contact with each other, said foils having opposed surfaces with a degree of cohesion between them such as to enable them to be pulled apart at a variable threshold value of negative sound pressure, thereby suppressing said negative pulses whereas positive sound pulses can be transmitted at almost unaltered levels in view of the existing mechanical contact of the foils.

4,618,797

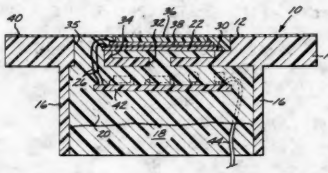
ENVIRONMENTALLY SEALED PIEZOELECTRIC SENSING ASSEMBLY FOR ELECTRICAL SWITCH

David J. Cline, 9 Loma Ave., Long Beach, Calif. 90803

Filed Dec. 24, 1984, Ser. No. 685,997

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—339 **17 Claims**



1. A sensing assembly for an electrical switch, said sensing assembly comprising:

enclosure means defining a cavity and including support means defining a supporting ledge and a stop means;

a flexible generally planar member resting at its edge portions upon said ledge in overlying, closely spaced relation to said stop means whereby said planar member is permitted flexure within the space between said planar member and said stop means, said stop means being engagable by said planar member to limit the degree of said flexure, and said space being in communication with said cavity;

a generally planar piezoelectric element attached to one of the surfaces of said flexible member and characterized on deformation by generation of an electrical signal;

electrical conductor means coupled to said piezoelectric element and extending into said cavity for carrying said signal; and

resiliently deformable potting means filling said space and extending into said cavity to block entry of moisture into said space and said cavity, the resilient deformability of said potting means enabling flexure of said flexible member and said piezoelectric element for generating said signal.

4,618,798

RESONATOR VIBRATING IN A THICKNESS-SHEAR MODE

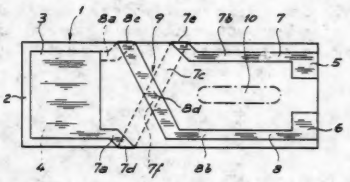
Walter Zingg, La Neuveville, Switzerland, assignor to Asulab A.S., Bienne, Switzerland

Filed Feb. 28, 1985, Ser. No. 706,830

Claims priority, application Switzerland, Apr. 6, 1984, 1743/84

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—366 **8 Claims**



1. A resonator adapted to vibrate in a thickness-shear mode and including a plate of piezo-electric material and plate vibrating means, said plate having a zone for fastening the resonator mechanically to a support and said plate vibrating means comprising a first electrode on a first surface of the plate, a second electrode on a second surface of the plate opposite the first electrode, means for connecting the first and second electrodes electrically to different potentials of an oscillator circuit to provide a main electric field between the first and second electrodes for generating a main vibration of said plate and including a first terminal on said plate connected to said first electrode by a first conductor and a second terminal on said plate connected to said second electrode by a second conductor, a third electrode connected electrically to the first electrode and disposed on the second surface of the plate between the second electrode and the mechanical fastening zone, and a fourth electrode connected electrically to the second electrode and disposed opposite the third electrode on the first surface of the plate, said third and fourth electrodes being arranged to provide therebetween an auxiliary electric field in a direction opposite to said main electric field for generating an auxiliary vibration of said plate in opposition of phase with respect to said main vibration generated by said main electric field for decreasing the amplitude of the vibration of the plate in said mechanical fastening zone.

4,618,799

FLASHLIGHT BULB

James A. Carley, Rolling Hills, Calif., assignor to Carley, Torrance, Calif.

Filed May 3, 1984, Ser. No. 606,657

Int. Cl.⁴ H01J *5/48*

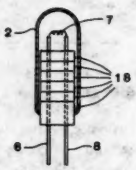
U.S. Cl. 313—318 **1 Claim**

1. A precision flashlight bulb in which a filament is accu-

rately located within an envelope by limiting excessive lateral wandering of the envelope with respect to the filament during the sealing phase of manufacture, said precision flashlight bulb comprising:

a stack of cylindrical-shaped beads, said stack being cylindrical in shape and having a length that is at least as large as its diameter;

wires that pass through said stack to maintain its integrity and that extend from said stack in a direction parallel to its axis;



a filament connected between said wires; and,

an envelope, cylindrical in shape, fitting snugly over said stack and extending almost the entire length of said stack, having a closed end that encloses said filament, and having an open end that is joined to said stack, whereby the snug fit of said envelope on said stack prevents said envelope from wandering laterally as the open end of said envelope is joined to said stack.

4,618,800

PRECISION ELECTRODE ALIGNMENT

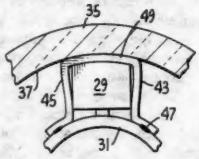
Kenneth G. Gorman, Jr., Capitola, Calif., assignor to Rank Electronic Tubes, Inc., Scotts Valley, Calif.

Filed Feb. 17, 1983, Ser. No. 467,343

The portion of the term of this patent subsequent to Feb. 21, 2003, has been disclaimed.

Int. Cl.[4] H01J *29/48, 29/82*

U.S. Cl. 313—417 **5 Claims**



1. In an electron tube having at least a portion of the envelope in the form of an elongated tubular neck with a plurality of spaced electrodes mounted concentrically within said neck, the improvement comprising:

(a) a plurality of elongated glass rods surrounding said electrodes and lying parallel to said neck,

(b) pins anchoring said rods to said electrodes,

(c) the outer surface of said rods being convex and congruent to and spaced from the inner surface of said neck,

(d) a plurality of metal straps each having a U-shape extending over said rods and being anchored on each side of a rod to an electrode,

(e) the bight of the U forming a tight fit between the outer surface of the rod and the inner surface of the neck, and

(f) the legs of the U being bowed outwardly and exerting tension in the neck.

4,618,801

FLAT CATHODE RAY TUBE

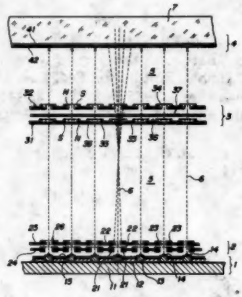
Mitsuteru Kakino, 14-37, Nishino-cho, Kitakazan, Yamashina-ku, Kyoto, Japan, assignor to Mitsuteru Kakino, Kyoto, Japan

Filed Aug. 5, 1983, Ser. No. 520,815

Claims priority, application Japan, Jan. 10, 1983, 58-002588; Feb. 23, 1983, 58-029726

Int. Cl.[4] H01J *29/50, 31/00*

U.S. Cl. 313—495 **6 Claims**



1. A flat cathode ray tube comprising:

a plurality of cathodes arranged in a two dimensional array, formed as individual elements by patterning a uniform layer of thermionic emissive material which overlies a first planar insulating substrate, and means for energizing each of said cathodes be energized individually in turn in the horizontal and vertical pattern corresponding to the scanning of a picture for television;

a second planar insulating substrate parallel to and spaced from the first insulating substrate, adjacent to the plurality of cathodes, and including a like plurality of individual apertures aligned with individual ones of the plurality of cathodes;

a like plurality of control grids surrounding individual ones of the plurality of apertures for alignment with the plurality of cathodes and having been formed by patterning a layer of conductive material overlying the second insulating substrate;

an anode comprising an anode plate electrode coated with fluorescent material and aligned for irradiation by electrons from the plurality of cathodes passing through the apertures in the second insulating-substrate; and

an enclosure for enclosing the cathodes, grids and anode in a high vacuum.

4,618,802

HERMETICALLY SEALED ENCLOSURE FOR THIN FILM DEVICES

Martin P. Schrank, Ipswich, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Oct. 29, 1984, Ser. No. 665,896

Int. Cl.[4] H05B *33/04*

U.S. Cl. 313—512 **8 Claims**

1. A hermetically sealed enclosure for a thin film device, said enclosure comprising:

frame means;

a light transmitting, electrically insulated substrate having a thin film matrix positioned on one side thereof, said substrate having indentations therein and said thin film matrix including conductive contacts extending therefrom and into a respective one of said indentations, said contacts being supported by said substrate, said substrate being in contact with said frame means and made of a material having a coefficient of thermal expansion substantially similar to the material forming said frame means;

hermetic seal means adjacent said substrate and in contact with said frame means;

a pair of electrical conductors electrically coupled to said thin film matrix; and

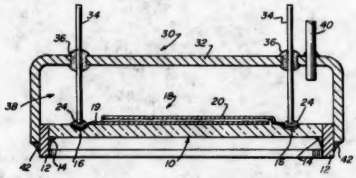
cover means hermetically sealed to said frame means, said cover means, said frame means, and said substrate defining a chamber therebetween wherein said thin film matrix is located, said cover means supporting said conductors extending therethrough.

6. A method of hermetically sealing a thin film device, said method comprising the steps of:

providing frame means;

sealing a plate to said frame means to form a hermetic seal;

disposing a light transmitting, electrically insulating substrate having indentations formed therein in contact with said frame means, said substrate being made of a material having a coefficient of thermal expansion substantially similar to the material forming said frame means;



forming a thin film matrix on one side of said substrate having said indentations, said thin film matrix having conductive contacts extending therefrom and into a respective one of said indentations, said indentations then being filled with a conductive adhesive;

securing cover means to said frame means, said cover means having a pair of electrical conductors extending therefrom and into said conductive adhesive upon securing said cover means, said cover means, said frame means and said substrate defining a chamber therebetween, said thin film matrix being located within said chamber;

heating said conductive adhesive for a predetermined period of time at a predetermined temperature thereby curing said adhesive and fixedly joining said contacts and conductors; and

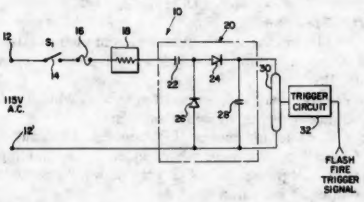
hermetically sealing said cover means and said frame means to define an enclosed thin film device.

4,618,803

CURRENT LIMITED STROBE CHARGE CIRCUIT

Herbert L. Hardy, Sudbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 19, 1984, Ser. No. 673,101
Int. Cl.⁴ H05B *41/32*
U.S. Cl. 315—241 R **7 Claims**



1. An electronic flash comprising:

a flash discharge tube;

a storage capacitor;

trigger circuit means responsive to an applied flash fire trigger signal for effecting the discharge of said capacitor through said discharge tube to produce an illuminating flash of light;

means responsive to an applied source of electrical energy for charging said storage capacitor; and

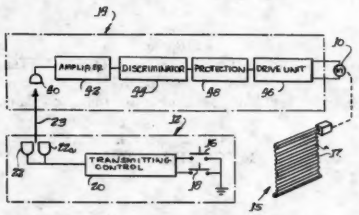
a positive temperature coefficient resistor element in serial connection between the source of electrical energy and said capacitor charging means to control the current flow from the source of electrical energy to said storage capacitor, said positive temperature coefficient resistor automatically switching to a high resistance mode to safely limit the flow of current during the reforming of said storage capacitor by said charging means and a low resistance mode so as not to materially affect the flow of current during the charging of said storage capacitor by said charging means subsequent to said storage capacitor being reformed.

4,618,804

REMOTE CONTROL APPARATUS FOR OPENING AND SHUTTING A BLIND

Masashi Iwasaki, Osaka, Japan, assignor to Kanematsu-Gosho, Ltd., Kobe, Japan

Filed Jun. 14, 1985, Ser. No. 745,275
Claims priority, application Japan, Jun. 28, 1984, 59-134722
Int. Cl.⁴ H04Q *9/14*
U.S. Cl. 318—16 **6 Claims**



1. A remote control system for controlling bidirectional rotation of an electric motor comprising: a hand-held transmitter provided with a transmitting control circuit capable of developing a forward rotation command signal and a reverse rotation command signal and transmitting means responsive to each of said command signals for transmitting a predetermined, corresponding number of infrared pulses for a predetermined amount of time; and a receiver and drive unit operatively coupled with said electric motor and comprising receiving means responsive to said infrared pulses from said transmitting means for developing a corresponding received command signal, a discriminator circuit for determining whether said received command signal corresponds to the command signal for forward rotation or reverse rotation, and drive circuit means responsive to said discriminator circuit for energizing said electric motor for rotation in a corresponding direction; wherein said receiver and drive unit further includes a protection circuit coupled intermediate said discriminator circuit and said drive circuit and responsive to a current surge produced by stalling of said electric motor for causing the discrminator circuit to produce a control signal opposite to the received signal for reversing the direction of rotation of the motor.

4,618,805

DEVICE FOR REGULATING ROTARY SPEED OF AN ALTERNATING CURRENT ELECTRIC MOTOR

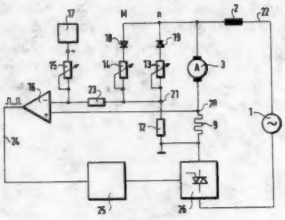
Friedrich Hornung, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 14, 1985, Ser. No. 734,385

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1984, 3422458

Int. Cl.[4] H02P 7/36

U.S. Cl. 318—245 13 Claims



1. A device for regulating rotary speed and torque of an alternating current electric motor having an armature winding connected as a branch of a bridge circuit balanced for a fixed rotary speed and a fixed operational voltage of the motor, comprising a current adjuster having a control input and being connected for controlling current flowing through said armature winding, another branch of said bridge circuit including polarity dependent resistive means for rectifying voltages generated across said another branch during alternating half-waves of the current; and control means controlled by a voltage generated across a diagonal of said bridge circuit and having an output connected to the control input of said current adjuster to regulate during halfwaves of one polarity the rotary speed and during halfwaves of opposite polarity the operational voltage of the motor.

4,618,806

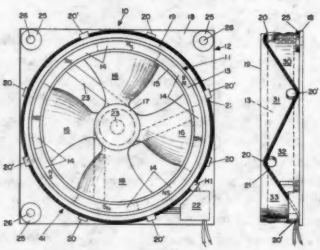
IRONLESS, BRUSHLESS DC MOTOR WITH WAVE-WINDING

Alan Grouse, Cary, N.C., assignor to Rotron, Inc., Woodstock, N.Y.

Filed Feb. 11, 1985, Ser. No. 700,670

Int. Cl.[4] H02K 29/08

U.S. Cl. 318—254 14 Claims



12. A fan and motor combination including an annular permanent magnet having a relatively large central opening therethrough and magnetized segments, wherein succeeding segments of like polarity are circumferentially spaced apart, fan blades secured to the magnet internally thereof in the central opening, wave-shaped coil means surrounding the magnet and supported proximate the magnet on a cylindrical support surface encircling the magnet to produce areas of oppositely directed electromagnetic fields proximate the magnet, detection means responsive to the position of the annular magnet segments, and means responsive to the detection means to repeatedly energize the coil means to exert a rotational torque on the annular magnet.

4,618,807

REVERSING CONTACTOR FOR A THREE-PHASE MOTOR

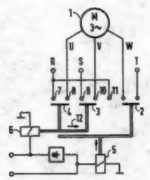
Edgar Wiessner, Amberg; Werner Harbauer, Schwandorf, and Klaus-Dieter Paul, Sulzbach-Rosenberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Apr. 16, 1985, Ser. No. 723,659

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3415019

Int. Cl.[4] H02P 1/40; H01H 9/00

U.S. Cl. 318—280 7 Claims



1. A three-phase, reversing contactor for use with an electric machine with a housing, fixed-mounted contact parts for input and output power lines and contact bridges connecting the input and output lines, having a common drive mechanism and a positioning mechanism for switching the flow of current between the input and output lines to another configuration, comprising;

two separate movable contact bridge carriers aligned in parallel to one another providing mounting in place in a grouped fashion for said contact bridges, coupled alternatively and selectably by said positioning mechanism to said drive mechanism;

said positioning mechanism having a reversing yoke moveable by means of an auxiliary magnet connected to a switching magnet, and said yoke having a free end providing a selectable mechanical coupling to said parallel aligned movable contact bridge carriers.

4,618,808

ELECTROMAGNETIC ACTUATOR SYSTEM USING STEPPER MOTOR WITH CLOSED LOOP POSITION SENSING, ELECTRONIC COMMUTATION AND DYNAMIC POSITION AND ANOMALY CORRECTION

Jehuda Ish-Shalom, Croton-on-Hudson; Leonard A. Katz, Yorktown Heights, and Dennis G. Manzer, Bedford Hills, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 30, 1985, Ser. No. 696,568

Int. Cl.[4] H02P 8/00

U.S. Cl. 318—696 4 Claims

1. An electromagnetic actuator system characterized by

(a) a stepper motor (11–12) having a plurality of windings (A,B,C);

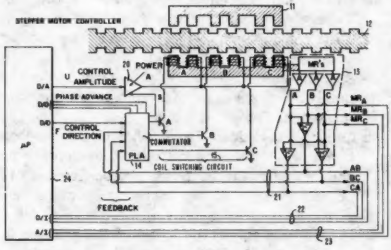
(b) power means (20), connected to said windings (A,B,C), to supply power to said windings;

(c) coil switching means (15), connected to said windings (A,B,C) to complete when selected the enabling circuit from said power means (20) through the selected enabled coil upon activation;

(d) means (14), having a plurality of input nodes, to provide position and anomaly corrected switch selection signals as a composite function of a control direction signal and a pattern of present armature position signals to provide a

related pattern of enabling coil selection signals to said coil switching means (15); and

(e) position sensing means (13), monitoring the armature (12) position of said stepper motor and feedback connected to



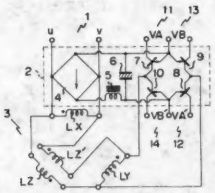
said programmable logic means (14) to provide a pattern of present armature position signal inputs to said means (14) to provide position and anomaly corrected switch selection signals.

4,618,809

APPARATUS FOR CONVERTING SINGLE-PHASE POWER TO THREE-PHASE OUTPUTS

Naoyuki Maeda, Inuyama, Japan, assignor to Tokai TRW & Co., Ltd., Aichi, Japan

Filed Jun. 7, 1985, Ser. No. 742,204
Claims priority, application Japan, Jun. 8, 1984, 59-118008
Int. Cl.⁴ H02P *7/00*
U.S. Cl. 318—768 **3 Claims**



1. An inverter apparatus for converting a single-phase A.C. power source to three-phase A.C. outputs, characterized in that the single-phase power source is directly connected to first phase load means and is connected through one-phase converter means to second phase load means, and the single-phase power source and the one-phase converted single-phase power source are connected to third phase load means and fourth phase load means, the third and fourth phase load means being formed by dividing single load means, so that three-phase power outputs are provided for the first phase load means, the second phase load means, and the third plus fourth phase load means.

4,618,810

VARIABLE SPEED AC MOTOR CONTROL SYSTEM

James E. Hagerman, Rancho Cucamonga; William D. Mathewes, Costa Mesa, both of Calif.; Fenton L. Rees, Rockford, Ill., and Albert J. Flack, Santa Ana, Calif., assignors to Emerson Electric Company, St. Louis, Mo.

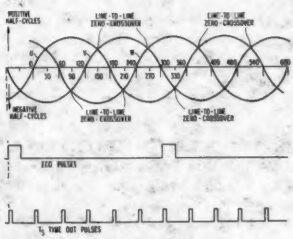
Filed Feb. 4, 1983, Ser. No. 464,114
Int. Cl.⁴ H02P *5/40*
U.S. Cl. 318—803 **10 Claims**

1. Apparatus for controlling the speed of an AC motor which is powered by a multi-phase AC input, said apparatus comprising:

a plurality of bridge rectifier SCR means respectively arranged to receive the input phases of the AC input and to supply a DC output in response thereto;

a plurality of inverter SCR means arranged in auxiliary commutated inverter configuration for converting said DC output into an AC output having a frequency proportional to said DC output, said inverter SCR means including a connecting means for supplying said AC output to the AC motor; and

control means for generating bridge rectifier SCR conduction and sequencing data, said control means including a timing means for generating zero-crossover signals which track the line-to-neutral zero-crossover points of each phase in the AC input, a first computing means connected to said timing means for generating bridge rectifier SCR



sequencing data which serves to identify the particular bridge rectifier SCR means in said plurality of bridge rectifier SCR means associated with each half cycle of each AC input phase in advance of gating said particular one of said bridge rectifier SRC means into conduction and a second computing means connected to said timing means for generating bridge rectifier SCR conduction data for each half cycle of each AC input phase in advance of the first line-to-line zero-crossover point for that half cycle, said bridge rectifier SCR conduction data serving to specify the conduction point in each half cycle of each AC input phase at which particular bridge rectifier SCR means associated with that half cycle is gate into conduction, said control means also including a bridge rectifier gating means connected to said timing means for gating the bridge rectifier SCR means on and off in accordance with said bridge rectifier SCR conduction and sequencing data.

4,618,811

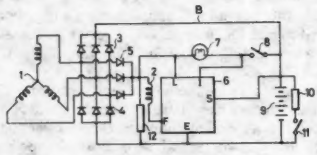
VOLTAGE REGULATOR FOR CHARGING GENERATOR

Keiichi Mashino, Katsuta; Morio Satou, Toukai-mura; Shouji Masumoto, Katsuta; Kunio Kobayashi, and Osamu Miki, both of Takasaki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Automotive Engineering Co., Ltd., both of Tokyo, Japan

Filed Feb. 10, 1984, Ser. No. 578,794
Claims priority, application Japan, Feb. 10, 1983, 58-19807
Int. Cl.⁴ H02J *7/14*
U.S. Cl. 322—28 **7 Claims**

1. A voltage regulator for a charging generator comprising: an a.c. generator having armature windings and a field winding; rectification means for rectifying an a.c. output of said a.c. generator to a d.c. output; a battery connected to an output terminal of said rectification means to receive power from said a.c. generator; an initial exciting current supply circuit including a key switch and a charge lamp connecting said battery to said field winding; a load connected parallel to said field winding; a voltage regulator including means for comparing the battery voltage with a reference voltage and means for controlling a current flowing through said field winding in accordance with an output of said comparing means; and abnormal-

ity detection means for comparing an output voltage of said rectification means with the battery voltage and producing an abnormality indication output when a difference between both voltages exceeds a predetermined value, wherein said current controlling means in said voltage regulator cuts off a current



flowing through said field winding in accordance with the abnormality indication output of said abnormality detection means so that the power generation of said a.c. generator is stopped and a current from said battery flows through said initial exciting current supply circuit and said load to light said charge lamp in said initial exciting current supply circuit.

4,618,812

DIRECT CURRENT POWER CONTROL ON SELECTABLE VOLTAGE STEP-UP AND STEP-DOWN

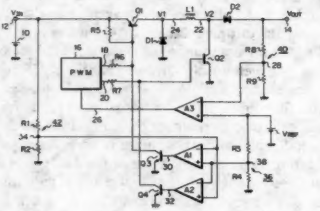
Chikuni Kawakami, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 20, 1985, Ser. No. 713,886

Claims priority, application Japan, Apr. 11, 1984, 59-70898

Int. Cl.[4] G05F *1/618*

U.S. Cl. 323—224 **3 Claims**



1. A DC power control circuit for converting an input DC voltage into an output DC voltage of a predetermined value comprising:

an input terminal receiving said input DC voltage;

a first inductor having an induction input terminal and an induction output terminal;

first semiconductor switch having a control terminal and first and second controlled terminals;

an output terminal developing said output DC voltage;

said first inductor and said controlled terminals of said first semiconductor switch being serially connected between said input terminal and said output terminal;

a second semiconductor switch having a control terminal and first and second controlled terminals, said controlled terminals of said second semiconductor switch being connected between said inductor output terminal and ground;

driver means, operatively connected to said output terminal, for comparing the output DC voltage with a first reference voltage and for modulating the conduction of said first and second semiconductor switches in response thereto, said drive means being operatively connected to said control terminals of said first and second switch means; and

control means, operatively connected to said input terminal, for comparing the input DC voltage with a second reference voltage to selectively enable said drive means to modulate the conduction of only one of said first and second semiconductor switches,

said control means including,

first and second comparator means, operatively connected to said input terminal for comparing said input DC voltage with said second reference voltage,

a third semiconductor switch having a control terminal connected to said first comparator means, and first and second controlled terminals connected between the control terminal of said first semiconductor switch and ground, and

a fourth semiconductor switch having a control terminal connected to said second comparator means, and first and second controlled terminals connected between the control terminal of said second semiconductor switch and ground;

said control means, when said input DC voltage is lower than said second reference voltage, disabling said first semiconductor switch to allow said drive means to modulate the conduction of only said second semiconductor switch;

said control means, when said input DC voltage is greater than said second reference voltage, disabling said second semiconductor switch to allow said drive means to modulate the conduction of only said first semiconductor switch.

4,618,813

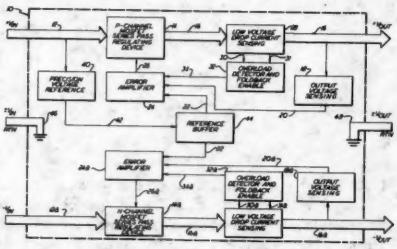
HIGH EFFICIENCY SERIES REGULATOR

Richard V. Vesce, East Hampton, and John R. Torres, Somers, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 4, 1985, Ser. No. 708,197

Int. Cl.[4] G05F *1/445*

U.S. Cl. 323—268 **3 Claims**



1. A three-terminal positive voltage series regulator, comprising:

an enhancement mode P-Channel FET series regulating element, responsive at its source node to a positive input voltage source and responsive to a control signal at its gate node for providing a positive regulated output voltage at its drain node;

a reference source, for providing a regulated reference voltage signal;

sensing means, responsive to said regulated output voltage for providing a sensed voltage signal indicative of the present magnitude of said regulated output voltage; and

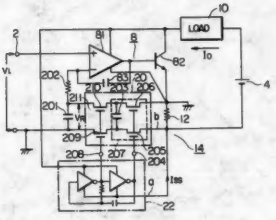
error sensing means, responsive to said reference voltage signal and to said channel voltage signal fro comparing the magnitude of said sensed voltage signal to the magnitude of said reference voltage signal and providing said control signal for regulating said sensed voltage signal at the same magnitude as said reference voltage signal.

4,618,814

VOLTAGE-TO-CURRENT CONVERTER CIRCUIT

Kazuo Kato, Ibaraki, and Hideo Sato, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 19, 1984, Ser. No. 622,159
Claims priority, application Japan, Jun. 20, 1983, 58-110668
Int. Cl.[4] G05F 1/44
U.S. Cl. 323—280 **13 Claims**



1. A voltage-to-current converter circuit for supplying a current proportional to an input signal voltage to a load, comprising:

an amplifying circuit receiving the input signal voltage and a feedback signal voltage to supply a current to said load corresponding to a difference between the input signal voltage and the feedback signal voltage;

resistor means for being fed with said current flowing through said load;

signal generating means for generating first and second control signals;

sample-hold circuit means for sampling and holding a voltage across said resistor means in accordance with said first control signal, said sample-hold circuit means including a capacitor for being charged with said voltage, and first switching means responsive to said first control signal for connecting said capacitor and said resistor means in parallel with each other when said voltage is charged in said capacitor; and

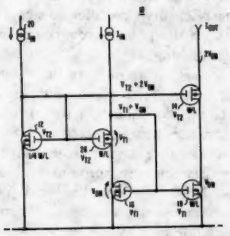
second switching means responsive to said second control signal for inverting a polarity of the held voltage by connecting said capacitor to said amplifying circuit after completion of the charging of said capacitor so that said charged voltage is inverted and inputted to said amplifying circuit as said feedback signal voltage.

4,618,815

MIXED THRESHOLD CURRENT MIRROR

Eric J. Swanson, Reading, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 11, 1985, Ser. No. 700,029
Int. Cl.[4] G05F 3/26
U.S. Cl. 323—315 **6 Claims**



1. An MOS current amplifying apparatus comprising at least two input MOS transistors, each having a conduction path and a gate electrode, the conduction paths being connected in parallel with each other;

means for providing an input current to each transistor of said at least two input MOS transistors;

at least two output MOS transistors associated in a one-to-one relationship with said at least two input MOS transistors, each output transistor having a conduction path and a gate electrode, the gate electrode of each of said at least two output transistors being coupled to a point in the input conduction path and also the gate electrode of said input transistor associated therewith, wherein at least one of said input transistors and at least one of said output transistors comprises a first threshold voltage (V_{T1}) greater in magnitude than a second threshold voltage (V_{T2}) associated with the remaining input and output transistors; and

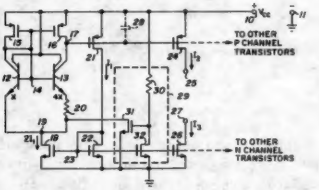
an equalizing MOS transistor including a drain, source and gate electrode, having its conduction path connected between one side of the conduction path of one of said at least two input transistors and the point at which the gate electrode of said one input transistor is connected to the input current path, said equalizing transistor providing currents of like magnitude to each input transistor and comprising a drain-to-source voltage equal to the first greater, threshold.

4,618,816

CMOS ΔV_{BE} BIAS CURRENT GENERATOR

Dennis M. Monticelli, Fremont, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 22, 1985, Ser. No. 768,274
Int. Cl.[4] G05F 3/16
U.S. Cl. 323—316 **5 Claims**



1. A bias current generator circuit for implementation in CMOS construction, said circuit comprising:

first and second BJTs, each one having a base, an emitter, a substrate dedicated collector and a lateral collector with the two collectors sharing the emitter current;

means for operating said first BJT at a higher emitter current density than said second BJT;

means for coupling the bases of said first and second BJTs together and to said lateral collector of said first BJT;

first and second IGFETS coupled together as a current mirror load for said lateral collectors of said BJTs;

means for coupling the emitter of said first BJT to a tail current source;

a resistor coupled between the emitter of said second BJT and said tail current source; and

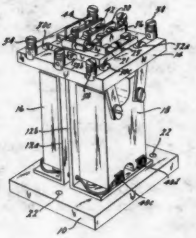
means for modulating said tail current source in response to the potential at said second BJT lateral collector whereby said circuit is stabilized and the potential across said resistor is PTAT.

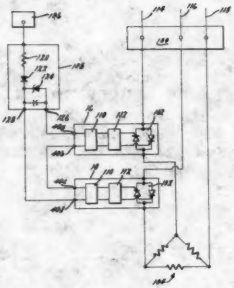
4,618,817

MULTIPLE PHASE SWITCHING CIRCUIT AND HEAT SINK STRUCTURE

Roger A. Holtslander, Mt. Clemens, Mich., assignor to Wolf Engineering Corporation, Dearborn, Mich.

Filed Sep. 12, 1985, Ser. No. 775,152
Int. Cl.[4] G05F 1/44; H05K 7/20
U.S. Cl. 323—322 7 Claims





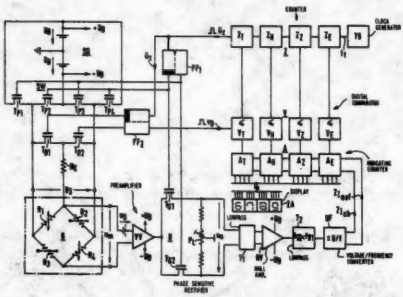
1. A three-phase electrical switching apparatus comprising, a generally rectangular bottom member, a top member constructed from an electrically non-conductive material, said top and said bottom members being separated and maintained in generally parallel places by connection to at least two parallel support members oriented generally perpendicular to said top and said bottom, a first and a second pair of inverse parallel connected silicon control rectifiers electrically connected respectively between a first and a second phase of an electrical power supply and a first and a second phase of an electrical load, a third phase of said power supply being connected to a third phase of said electrical load, said first pair of silicon control rectifiers being releasably secured to a first of said parallel support members and said second pair of silicon control rectifiers being releasably secured to a second of said parallel support members, said silicon control rectifiers having a switching means which is responsive to and electrically connected with an external logic source, said two parallel support members and said bottom member being constructed from a heat conductive material, and said electrical power supply, said electrical load and said external logic source being releasably connected to components of said apparatus by terminals releasably secured to said top member.

4,618,818

EVALUATION CIRCUITS FOR PASSIVE MEASUREMENT-VARIABLE PICKUPS

Klaus Horn, Braunschweig, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 643,875
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1983, 3330841
Int. Cl.[4] G01D 1/00
U.S. Cl. 324—62 19 Claims



1. In an evaluation circuit for a passive measurement variable pickup, the pickup having ohmic sensor resistor means disposed in a bridge circuit having a feed diagonal and an output measurement diagonal, said circuit further having clock pulse counter means, digital comparator means, sign sensitive voltage to frequency converter means, phase-sensitive rectifier means, low pass filter means and balancing adjustment means for adjusting an output signal of the pickup, said adjustment means including switching means having first and second switching positions and providing duration-modulated switching via said switching means of a switchable resistor into said first and second switching positions, said resistor being switched into said first position by an overflow signal from said clock pulse counter means and into said second position by an output signal of said digital comparator means, said digital comparator means comprising the contents of the clock pulse counter means and of said sign sensitive voltage of frequency converter means, an input voltage of the voltage to frequency converter means comprising an amplified balancing difference signal which is rectified by said phase-sensitive rectifier means and filtered by said lowpass filter means, the bridge circuit and the switchable resistor being fed by a polarity-reversing switch means controlled by the overflow signal of said clock pulse counter means from at least one of a d-c current and voltage source, the phase-sensitive rectifier means being controlled synchronously with the polarity-reversing switch means, the improvement comprising:

preamplifier means for amplifying the balancing difference signal, said preamplifier means further transmitting d-c components of said balancing signal, an output of said preamplifier means being coupled to an input of the phase-sensitive rectifier means, said preamplifier means having a linear phase frequency response in the transmission bandwidth of said preamplifier means and further having an amplitude independent gain characteristic, thereby preventing modulation of said balancing signal;

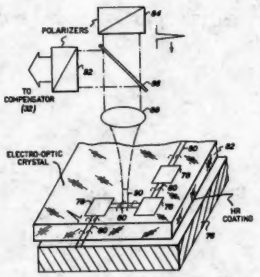
null amplifier means coupled to an output of said rectifier means; and

means for passing d-c components coupling said switchable resistor to said polarity-reversing switch means.

4,618,819
MEASUREMENT OF ELECTRICAL SIGNALS WITH SUBPICOSECOND RESOLUTION

Gerard Mourou, Rochester, N.Y., and Janis A. Valdmanis, Westfield, N.J., assignors to The University of Rochester, Rochester, N.Y.

Filed Mar. 27, 1984, Ser. No. 593,993
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 K **11 Claims**

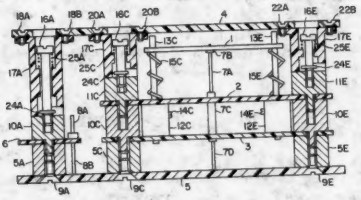


1. The method of measuring an electrical signal on a line in a micro-circuit with subpicosecond resolution which comprises the steps of propagating said signal along a line on a substrate of said micro-circuit which creates an electric fringe field adjacent thereto, placing an electro-optic crystal of dimensions of the same order as the micro-dimensions of said line adjacent and outside of said line and said substrate so that said field passes through at least a portion of said crystal and changes the index of refraction thereof and the polarization of optical radiation therethrough in accordance with the Pockels effect, passing a beam of optical pulses through said crystal in a direction transverse to the direction of said field to optically sample successively occurring portions of said signal, and processing said samples to provide a display of said signal.

4,618,820
PROBE SUPPORT FOR TEST FIXTURE OF PRINTED CIRCUIT ARTWORKS

Elvio Salvagno, and PierLuigi Piacentino, both of Caluso, Italy, assignors to Honeywell Information Systems Italia, Milan, Italy

Filed Jun. 15, 1984, Ser. No. 621,274
Claims priority, application Italy, Jul. 4, 1983, 21915 A/83
Int. Cl.[4] G01R *1/04, 31/02, 31/28*
U.S. Cl. 324—158 F **1 Claim**



1. A probe support for a test fixture for testing printed circuit artwork boards (PWA's) comprising:

a plurality of probes, each one provided with a contact tip biased by a spring and with a connection pin;

a plurality of connecting elements, each one provided with a contact tip and a connection pin electrically connected to the connection pin of a corresponding probe;

a first supporting plate for supporting said plurality of probes;

a second supporting plate for supporting said plurality of connecting elements;

a base plate parallel to said first and second supporting plates and facing the ends of the pins of said plurality of probes and said plurality of connecting elements;

first means for spacing said base plate from said first and second supporting plates;

second means removably attaching said base plate to said first and second support plates in the spaced relation imposed by said first means;

a cover plate parallel to said first and second supporting plates and facing the contact tips of said plurality of probes and said plurality of connecting elements;

third means for spacing said cover plate from said first and second supporting plates; and

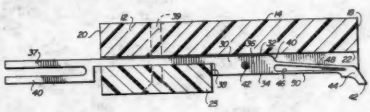
fourth means removably attaching said cover plate to said first and second support plates in the spaced relation imposed by said third means;

whereby said cover plate provides protection of said contact tips and unitary assembling of said first and second supporting plates when said base plate is removed from said first and second supporting plates to perform wiring operations on the harness between the pins of said probes and the pins of said connecting elements, and whereby said base plate provides protection of said pins and unitary assembly of said first and second supporting plates when said cover plate is removed for use of said probe support in a test fixture.

4,618,821
TEST PROBE ASSEMBLY FOR MICROELECTRONIC CIRCUITS

Seymour S. Lenz, P.O. Box 669, Longwood, Fla. 32750

Filed Sep. 19, 1983, Ser. No. 533,358
Int. Cl.[4] G01R *1/06, 31/02*
U.S. Cl. 324—158 P **14 Claims**



1. A test probe assembly for microelectronic circuits, comprising:

(a) a unitary support block of an electrically nonconductive material having first and second plane surfaces;

(b) said support block having plural test probe slots therein extending from said first surface and substantially short of said second surface to maintain the unitary structural integrity of said support block;

(c) plural flexible, electrically conductive test probes, each test probe positioned in one of said test probe slots and including a forward probe tip adapted to engage a test point of a microelectronic circuit, each said probe tip extending out of said block and away from said first surface and spaced from the extremity of the associated test probe slot a distance which permits the probe tip to recede into the test probe slot during testing;

(d) said support block further including a keyway extending from said first surface transverse to said test probe slots and into said support block a lesser dimension than said test probe slots;

(e) each said test probe further including a keyway therein corresponding in dimension and position to said support block keyway;

(f) a key positioned in said support block keyway and said keyways of all of said test probes; and

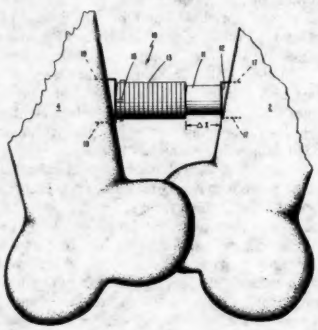
(g) means for fastening said key to said support block.

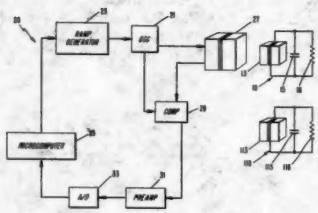
4,618,822

DISPLACEMENT SENSING DEVICE UTILIZING ADJUSTABLE TUNED CIRCUIT

Per K. Hansen, Burlington, Vt., assignor to Position Orientation Systems, Ltd., Burlington, Vt.

Filed Apr. 18, 1984, Ser. No. 601,681
Int. Cl.[4] G01B 7/14
U.S. Cl. 324—207 18 Claims





1. A method of monitoring the displacement of a first object with respect to a second object comprising the steps of:

(a) attaching a sensor to said objects, said sensor including circuit means having a variable resonant frequency, said resonant frequency being varied by moving means in said sensor (1) attached to said objects and (2) moved in conjunction with movements of said objects with respect to one another;

(b) measuring the resonant frequency of said sensor with measuring means unattached to said sensor;

(c) calculating the relative position of said moving means; and

(d) calculating the displacement of said first object with respect to said second object;

(e) further wherein said sensor circuit means comprises:

(1) capacitor means;

(2) coil means connected in parallel with said capacitor means;

(3) ferrite rod means located at least partially within said coil means;

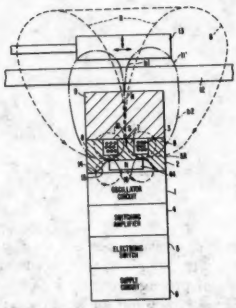
(4) said ferrite rod means being reciprocable with respect to said coil means, said coil means and ferrite rod means comprising said moving means.

4,618,823

INDUCTIVE PROXIMITY SWITCH HAVING AN OSCILLATOR MAGNETIC CORE AND A PERMANENT MAGNET FORMING A SATURATION-SENSITIVE MAGNETIZATION AREA

Peter Dahlheimer, Schalksmuehle, and Gerno Soyck, Halver, both of Fed. Rep. of Germany, assignors to Werner Turck GmbH & Co. KG, Halver, Fed. Rep. of Germany

Filed Sep. 30, 1983, Ser. No. 537,536
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1982, 3236224
Int. Cl.[4] G01B 7/14; H03K 17/95
U.S. Cl. 324—207 19 Claims



1. An inductive proximity switch comprising oscillator circuit means including an oscillator coil wound on a magnetic core for generating a magnetic field, electronic switch means connected to the oscillator circuit means and adapted to be actuated in dependence upon a damping of the oscillations of the oscillator circuit means, at least one auxiliary magnet having at least one pole surface forming an active surface of the proximity switch and the pole axis of said pole surface being substantially transversely directed with respect to the active surface so that the auxiliary magnet produces a sensor field having flux extending out from the active surface, a trip device fashioned of a permeable material and being moveably supported so as to be movable toward said active surface, and said auxiliary magnet being connected to the magnetic core of said oscillator circuit means so as to form a permeable unit, the flux of said magnetic core of said oscillator circuit means being completely closed by the auxiliary magnet, and wherein said permeable unit has a reduced cross-sectional area in which the magnetic fluxes of the auxiliary magnet and the magnetic core of said oscillator circuit means heterodyne, said reduced cross-sectional area forming a saturation-sensitive magnetization area, said reduced cross sectional area being adapted to be operated in saturation by a reduction in the magnetic resistance in the sensor field which occurs when the trip device is introduced into the sensor field, thereby damping the flux of the magnetic core of said oscillator circuit means.

4,618,824

METHOD OF TESTING THE OPERABILITY OF CHECK VALVES

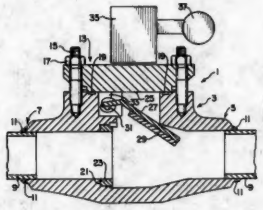
Robert D. Magee, Monroeville; Michael J. Asztalos, Churchill, and Vuong D. Trinh, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 16, 1984, Ser. No. 631,285
Int. Cl.[4] G01B 7/14
U.S. Cl. 324—208 5 Claims

1. A method of testing a check valve having a pivotal closure disk in a valve body, for operability, without the need for flow of fluid through the check valve, and without the need for any levers or extensions which extend through the valve body, comprising:

providing a check valve that is formed from a check valve body and first sealing member of nonmagnetic material and a pivotal closure disk of magnetic material having a second sealing member;

applying a magnetic field, by means of a magnetic field generator, to the check valve in a direction which will



cause the magnetic closure disk to move away from said first sealing member; and

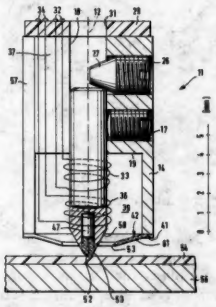
measuring the attraction between the magnetic field generator and the magnetic closure disk to determine the relative position of the magnetic closure disk to the first sealing member.

4,618,825

ELECTRO-MAGNETIC THICKNESS MEASURING PROBE

Helmut Fischer, Industriestrasse 21, 7032 Sindelfingen-6, Fed. Rep. of Germany

Filed Oct. 11, 1984, Ser. No. 659,654
Int. Cl.[4] G01B *7/10*; G01R *33/12*
U.S. Cl. 324—230 **19 Claims**



1. An electro-magnetic thickness measuring probe having:

a pot core of high permeable magnetic material which has a central bore, a pot chamber coaxial to the central bore accommodating a winding, and a pot rim,

a pole-piece of high permeable magnetic material having one end fixed into the central bore and a free front-face with a coaxial recess machined therein such that an outer shell remains around the recess, and a hard-metal pin seated in the recess having a front-face forming a crowned contact surface which stands a little proud of the pot rim, and

the improvement comprising:

said pin being of low permeable magnetic material relative to the pole-piece

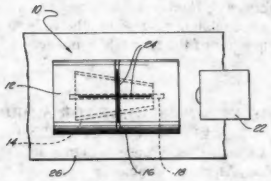
a coaxial annular disk made of highly permeable magnetic material, slot extending from the intrados-radius surface to the outer edge, having an outer edge in contact with the pot rim, and an intrados-radius surface having a diameter greater than the diameter of the pole-piece but significantly smaller than the diameter of the pot chamber, said intrados-radius surface lying close to the front-face of the pole-piece, whereby the magnetic resistance between the intrados-radius surface and the outer shell is significantly greater than the magnetic resistance between the intrados-radius surface and the free front-face when the measuring probe is set down on a surface.

4,618,826

QUALITY CONTROL PHANTOM FOR USE IN COMPUTED TOMOGRAPHIC IMAGING INSTRUMENTS AND METHOD OF USE

Stanford L. Smith, Lexington, Ky.; Paul C. Wang, Washington, D.C., and Charles W. Coffey, Lexington, Ky., assignors to U.K. Research Foundation, Lexington, Ky.

Filed Jul. 30, 1984, Ser. No. 635,600
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—308 **13 Claims**



1. A quality control phantom for use in the calibration and standardization of a computed tomographic imaging instrument, comprising:

a slab-like casing formed from a material type compatible with said computed tomographic imaging instrument;

a frustoconical groove formed in said casing, said groove including a material providing a different image signal from said casing during scanning with the instrument; and

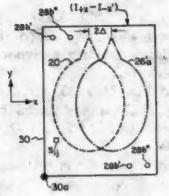
a central bore formed in said casing, defining a central axis of said frustoconical groove, said central bore including a material providing a different image signal from said casing during scanning with the instrument.

4,618,827

METHOD FOR HIGH-SPATIAL-RESOLUTION SPECTROSCOPIC NMR IMAGING OF CHEMICALLY-SHIFTED NUCLEI

Rowland W. Redington, Schenectady, N.Y., and Leon Axel, Philadelphia, Pa., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 10, 1984, Ser. No. 648,567
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **19 Claims**



1. A method for obtaining a high-spatial-resolution NMR image of a sample containing first and second chemically-shifted nuclei, the method comprising the steps of:

(a) forming a first NMR image of a selected region of the sample from projections along a first line extending in a first direction;

(b) forming a second NMR image of the selected region

from projections along the same first line but extending in a second direction;

(c) selecting the second direction to be opposite to the first direction and to cause the first and second NMR images to each comprise a first image component produced by the first nuclei and a second image component produced by the second nuclei and with the second image component offset from the first image component by the chemical shift between the first and second nuclei;

(d) mirroring the second NMR image about a second line orthogonal to the first line;

(e) registering the first image components of the first and mirrored second NMR images;

(f) combining the first and mirrored second registered NMR images so as to eliminate the first image components and to produce a composite image containing second image components; and

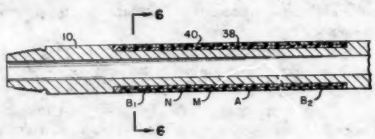
(g) processing the composite image to produce a resolved image containing substantially only the second image component of the first NMR image.

4,618,828

INSULATING SEGMENT FOR A DRILL STRING ELECTRODE STRUCTURE

Jean C. Raynal, Pau, France, assignor to Teleco Oilfield Services Inc., Meriden, Conn.

Filed Nov. 12, 1982, Ser. No. 440,753
Int. Cl.[4] G01V *3/20*; E21B *49/00*
U.S. Cl. 324—347 **7 Claims**



1. An electrode structure for a drill string, including:

a drill string segment having a recess defining a recessed surface along an axial length thereof;

a first sleeve of insulating material in said recess on the recessed surface of said drill string segment;

a second sleeve of insulating material on said first sleeve of insulating material;

said first and second sleeves of insulating material being of different hardness, with said second sleeve being harder than said first sleeve, said second sleeve of insulating material providing protection against abrasion and said first sleeve permitting absorption of lateral loads; and a plurality of electrodes embedded in said second sleeve.

4,618,829

BRIDGE CIRCUIT DEMODULATOR

Rudolf Hasler, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 22, 1985, Ser. No. 693,434
Claims priority, application Austria, Jan. 20, 1984, 189/84
Int. Cl.[4] H03D *3/00*
U.S. Cl. 329—103 **9 Claims**

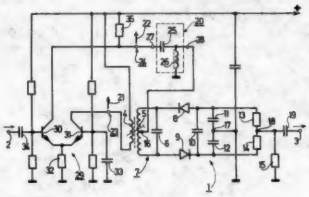
1. A demodulator bridge comprising:

a resonant circuit comprising a secondary winding of a transformer connected in parallel with a resonating capacitance;

a primary winding of said transformer connected to a signal source of modulated signals for coupling said signals to said resonant circuit;

an inductor-capacitor LC phase shift circuit connected to supply said modulated signals to said resonant circuit at a phase shifted angle of substantially 90° independent of said primary winding;

first and second oppositely polarized diodes connected to each end of said resonant circuit; and



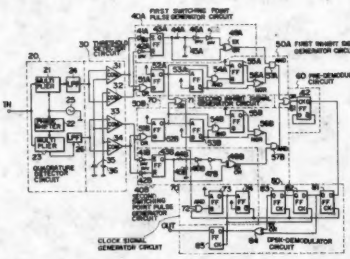
a capacitor network connected across said diodes for receiving charging currents proportional to the frequency of said modulated signals.

4,618,830

PSK DEMODULATOR USING ASYNCHRONOUS LOCAL OSCILLATOR

Masaharu Mori, and Ryuichi Asai, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1984, Ser. No. 681,597
Claims priority, application Japan, Jan. 9, 1984, 59-1737
Int. Cl.[4] H04L *27/22*
U.S. Cl. 329—105 **2 Claims**



1. A PSK demodulator comprising:

a local oscillator circuit working asynchronously with respect to the carrier phase of an inputted butst PSK signal;

carrier phase information detection means including first and second multipliers for multiplying a first output signal obtained from said local oscillator circuit and a second output signal shifted in phase by 90 degrees with respect to the first output signal, respectively, by said inputted burst PSK signal;

a reference voltage source generating a first reference voltage and a second reference voltage which is lower than the first reference voltage;

signal level discriminator means generating 4 sorts of level signals, 2 of which are produced when the output signal from said first multiplier is higher than the first reference voltage and another 2 of which are produced when the output signal from said second multiplier is lower than the second reference voltage, by comparing the output signals of the first and second multipliers with the first and second reference voltages; and

PSK circuit means for demodulating the inputted burst PSK signal, based on said 4 sorts of level signals, said PSK circuit means including:

first and second switching point pulse generator means for generating a pulse, every time respective 2 sorts of signals corresponding to the output signals coming from said first and second multipliers are applied alternatively thereto;

first and second inhibit signal generator means for generating inhibit pulses having a predetermined width, when the period of pulses obtained by logically adding said respective 2 sorts of signals is longer than a predetermined period of time;

first logic multiplication means for logically multiplying the output of said first switching point pulse generator means by that of said first inhibit signal generator means;

second logic multiplication means for logically multiplying the output of said second switching point pulse generator means by that of said second inhibit signal generator means;

first logic addition means for logically adding the outputs of said first and second logic multiplication means; and

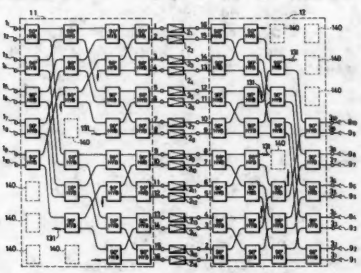
clock signal generating means for generating clock pulses having a constant period;

modulating signal demodulation means for generating pulses whose polarity is inversed in response to said clock pulses, every time a pulse output of said logic addition means is applied thereto.

4,618,831
POWER AMPLIFYING APPARATUS

Shunichiro Egami, Yokosuka, and Makoto Kawai, Yokohama, both of Japan, assignors to Nippon Telegraph & Telephone Corporation, Tokyo, Japan

Filed Sep. 13, 1985, Ser. No. 775,976
Claims priority, application Japan, Sep. 25, 1984, 59-200959
Int. Cl.[4] H03F *3/68*
U.S. Cl. 330—124 R **7 Claims**



1. A power amplifying apparatus comprising:

a first multi-port hybrid coupler having M input terminals and N output terminals and formed by n stages of 90° hybrid couplers alone, the first of said stages including the number, M/2, of 90° hybrid couplers, the nth stage including the number, 2^{n-1}, of 90° hybrid couplers, and the first through nth stages of said 90° hybrid couplers being operative to distribute a signal input to any one of said M input terminals equally to said N output terminals, where $N>M$, $N=2^n$, n is an integer that is at least equal to 2, and M/2 represents an integer having any decimal value of M/2 raised to a unit;

N amplifiers connected directly to respective ones of said N output terminals of said first multi-port hybrid coupler;

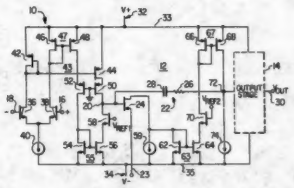
a second multi-port hybrid coupler having N input terminals connected to the output sides of respective ones of said N amplifiers, said second multi-port hybrid coupler having M output terminals and being formed by n stages of 90° hybrid couplers alone, the first stage in said second hybrid coupler including the number, 2^{n-1}, of 90° hybrid couplers, the nth stage in said second hybrid coupler including the number, M/2, of 90° hybrid couplers, and the first through nth stages of said 90° hybrid couplers of said second multi-port hybrid coupler being operative to combine the distributed signal components input to said N input terminals into one at the one of said M output terminals of said second multi-port hybrid coupler which corresponds to the one of said M input terminals of said first multi-port hybrid coupler; and

dummy loads connected to unused ones of said input and output terminals of the 90° hybrid couplers in said first and second multi-port hybrid couplers.

4,618,832
DIFFERENTIAL AMPLIFIER WITH IMPROVED POWER SUPPLY REJECTION RATIO

Stephen R. Schenck, McKinney, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

'ed Jun. 18, 1985, Ser. No. 746,212
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—254 **1 Claim**



1. A differential amplifier having improved immunity to signals on the power supply inputs thereof, comprising:

an input differential stage including first and second transistors coupled to the inputs of said amplifier, first and second current mirrors each connected respectively between one of the power supply inputs and said first and second transistors, and a current source connecting said first and second transistors to the other power supply input;

a gain stage having a MOS transistor with a source input, current mirror means connected to the output of said MOS transistor and to the power supply inputs for providing an output voltage with upper and lower limits corresponding substantially to the voltages on said power supply inputs;

an amplifier output terminal connected to the source input of said MOS transistor for referencing said MOS transistor to desired low noise references; and

means for connecting said input differential stage to said MOS transistor for driving said MOS transistor with a differential signal about a predetermined circuit potential.

4,618,833
OPERATIONAL AMPLIFIER OFFSET TRIM THAT DOES NOT CHANGE THE OFFSET POTENTIAL TEMPERATURE DRIFT

Ronald W. Russell, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

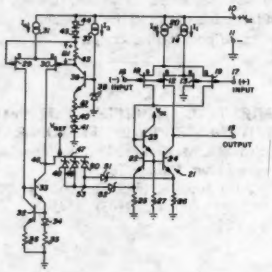
Filed Aug. 12, 1985, Ser. No. 764,450
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—256 **6 Claims**

1. A differential amplifier circuit including a differentially connected input transistor pair which has an offset potential that drifts with temperature change and an offset trimming circuit which reduces said offset potential to an acceptable value without changing the offset potential temperature drift, said offset trimming circuit comprising:

a compensation transistor pair connected as a differential amplifier;

means for applying a constant, temperature independent, input potential to said compensation transistor pair thereby to unbalance conduction in said compensation pair and to develop a compensation current related to the unbalanced conduction in said compensation pair and

which varies with temperature inversely with the transconductance in said input transistor pair; and



means for coupling a portion of said compensation current to said input transistor pair wherein said portion is coupled to reduce said offset potential.

4,618,834

VARIABLE CHARACTERISTICS AMPLIFIER CIRCUIT

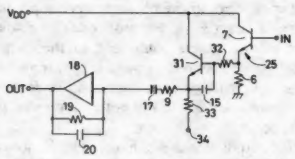
Hiroo Adachi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 10, 1985, Ser. No. 753,468

Claims priority, application Japan, Jul. 10, 1984, 59-104238[U]

Int. Cl.⁴ H03G *3/30*

U.S. Cl. 330—284 **8 Claims**



1. A variable characteristics amplifier circuit comprising:

an active element provided with a pair of controlled terminals and a single controliing terminal and conductive in a forwardly biased state;

an amplifier circuit having a feedback circuit coupled between input and output terminals thereof, said input terminal being connected to a selected one of said controlled terminals of said active element;

means for selectively reversely biasing said active element in accordance with a characteristics varying command; and

an impedance element connected between said one controlled terminal and said controlling terminal.

4,618,835

PROXIMITY SENSOR OSCILLATOR UTILIZING CONTROLLED CHARGE

Michael A. Wilson, Berthoud, Colo., assignor to Maranantha Research Ltd., Franklin, W. Va.

Filed Nov. 27, 1984, Ser. No. 675,425

Int. Cl.⁴ G01V *3/11*; H03B *5/12*

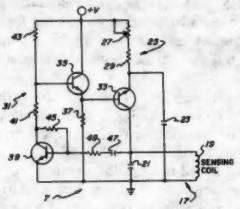
U.S. Cl. 331—65 **15 Claims**

1. A proximity oscillator device, comprising:

a continuously oscillating resonant circuit one element of which provides a sensor that is responsive to a conductive object such that the distance therebetween has an inverse effect on the power loss of said resonant circuit;

controlled charge means connectable with a power supply and with said resonant circuit, said controlled charge means, when discharged, providing a substantially constant metered charge; and

switching means connected between said controlled charge means and said resonant circuit to effect periodic discharge of said substantially constant metered charge from



said controlled charge means to said resonant circuit with at least one measurable parameter of said power loss of said resonant circuit being substantially uneffected by said supplied charge so that said parameter provides an indication of the proximity to said sensor of a conductive object causing said power loss of said resonant circuit.

4,618,836

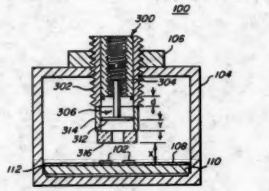
WIDE BAND DIELECTRIC RESONATOR OSCILLATOR HAVING TEMPERATURE COMPENSATION

Mark A. Gannon, Carpentersville; Francis R. Yester, Jr., Arlington Heights, and Paul H. Gailus, Prospect Heights, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 24, 1984, Ser. No. 685,662

Int. Cl.⁴ H03B *5/18, 7/14*

U.S. Cl. 331—96 **5 Claims**



1. An improved wide-band microwave dielectric oscillator with a removable channel element having a dielectric resonator which determines the frequency of operation and with a substrate for supporting active oscillator circuitry, comprising:

(a) a housing for electrically shielding and containing the microwave dielectric oscillator;

(b) a substrate having a conductive pattern deposited thereon which couples the dielectric resonator to the active oscillator circuitry; and

(c) a removable dielectric resonator channel element said channel element mounted in said housing in a manner which places said dielectric resonator in a proximity which provides coupling via electromagnetic field with the conductive pattern on said substrate.

4,618,837

LOW-POWER CONSUMPTION REFERENCE PULSE GENERATOR

Yoshiaki Matsuura, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jun. 29, 1982, Ser. No. 393,307

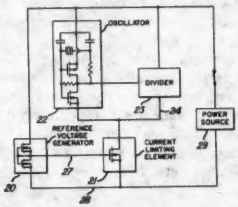
Claims priority, application Japan, Jul. 3, 1981, 56-104846

Int. Cl.⁴ H03B *5/32*

U.S. Cl. 331—160 **15 Claims**

1. A reference pulse generator for use with a power source

comprising: a quartz crystal oscillator for producing an oscillatory output; a frequency divider connected to receive the oscillatory output of the oscillator; a reference voltage generator for producing a reference voltage; and a constant current



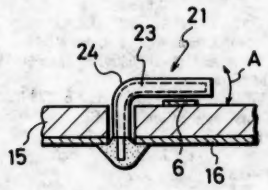
generator connected in series both with the oscillator and the frequency divider to control the current applied to the oscillator and the frequency divider from a power source, the constant current generator being connected to receive the reference voltage produced by the reference voltage generator.

4,618,838

IMPEDANCE ADJUSTING ELEMENT FOR A MICROSTRIP CIRCUIT

Tadashi Kajiwara; Akira Sato; Shinobu Tsurumaru, all of Kanagawa, and Kenichiro Kumamoto, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 12, 1985, Ser. No. 700,915
Claims priority, application Japan, Feb. 27, 1984, 59-35788
Int. Cl.⁴ H01P *5/00, 1/00*
U.S. Cl. 333—33 **15 Claims**



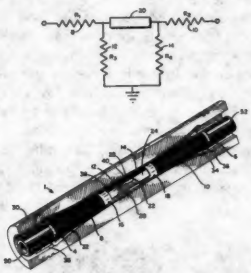
1. A microstrip circuit comprising:
a signal transmission line;
a circuit element connected at one end to said signal transmission line;
an impedance matching element connected in parallel to said signal transmission line; and
an electrically conductive wire element having one end connected to ground potential and arranged in proximity to at least one of said signal transmission line and said impedance matching element and being arranged for free movement in space above said transmission line and said impedance matching element with said one end taken as a supporting point, whereby a spatial position of said conductive wire element relative to one of said signal transmission line and said impedance matching element is varied to vary an effective impedance of said signal transmission line relative to said circuit element.

4,618,839

MICROWAVE ATTENUATOR

Jon E. Barth, 1300 Wyoming St., Boulder City, Nev. 89005

Filed Apr. 11, 1985, Ser. No. 722,210
Int. Cl.⁴ H01P *1/22*
U.S. Cl. 333—81 A **17 Claims**



1. A microwave attenuator comprising
a dielectric base having an elongate, generally cylindrical peripheral surface,
a first resistive strip deposited on said surface adjacent an end portion of the attenuator,
a second resistive strip deposited on said surface adjacent another end portion of the attenuator,
first and second spaced annular conductive bands deposited on said surface adjacent said first and second resistive strips, respectively, said bands defining an interior annular portion of the cylindrical surface between said end portions,
a first conductive strip connecting said conductive bands,
a second conductive strip intermediate said conductive bands,
a third resistive strip disposed between said first conductive band and said second conductive strip and in electrical connection therewith, and
a fourth resistive strip disposed between said second conductive band and said second conductive strip and in electrical connection therewith.

4,618,840

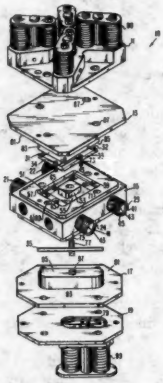
AIR-LINE MICROWAVE COAXIAL REVERSING SWITCH HAVING DIAGONALLY SWITCHED PATH

Harold H. Yee, Rancho Palos Verdes, and James F. Hudson, Manhattan Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 9, 1984, Ser. No. 598,102
Int. Cl.⁴ H01P *1/10*
U.S. Cl. 333—105 **10 Claims**

1. An air-line RF switch comprising:
an RF cavity unit housing defining respective first and second adjacent RF cavities substantially disposed in respective first and second substantially parallel and spaced apart positions, the cavity unit housing having a square cross section, said first RF cavity having a plurality of RF cavity segments substantially in the first position, said first RF cavity, having a plurality of interconnecting grooves disposed therewithin, said second RF cavity, disposed substantially in the second position; the second cavity having a groove that is located in a substantially diagonal relationship to the interconnecting grooves of said first RF cavity;
first, second, third and fourth RF ports connected to the RF cavity housing, the first and second ports also located on one side of the RF cavity housing, the third and fourth ports located on an oppositely disposed side of the cavity housing, in relation to the first and second port, the first

and the third ports being located in a first diagonal relationship with each other, the second and the fourth ports being located in a second diagonal relationship with each other, each of the ports comprising a center conductor disposed within an outer conductor, the outer conductor of each of the ports being connected to the cavity housing, the center conductors of said first, second, third and fourth ports extending to the interior of said first RF cavity, the center conductors of the first and third ports also extending to the interior of said second RF cavity, the center conductors of the first and third ports extending to the interior of the first RF cavity at substantially diagonally opposed portions of said first RF cavity and extending to the interior of the second cavity at substantially opposite ends thereof, the center conductors of said second and fourth ports extending to the interior of said first RF cavity at substantially different diagonally opposed portions of said first RF cavity, said first, second, third



and fourth ports each being substantially equally spaced from adjacent ports about said first RF cavity;

actuable first, second, third and fourth RF transfer bars disposed within said first cavity, said first bar when actuated, electrically connecting the center conductors of said first and second RF ports, said second bar when actuated, electrically connecting the center conductors of said second and thrid RF ports, said third bar when actuated, electrically connecting the center conductors of said third and fourth RF ports, said fourth bar when actuated, electrically connecting the center conductors of said fourth and first RF ports;

an actuable fifth RF transfer bar disposed within said second cavity, said fifth RF transfer bar when actuated, diagonally electrically connecting the center conductors of said first and third RF ports; and

actuation means for actuating said first, second, third, fourth and fifth RF transfer bars.

4,618,841

ELECTRONIC COMPONENT FUNCTIONING WITH REFLECTED ACOUSTIC WAVES

Gerd Riha, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 520,418, Aug. 4, 1983, Pat. No. 4,520,330. This application Feb. 8, 1985, Ser. No. 699,949

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1982, 3230038; Feb. 9, 1984, 3404618

Int. Cl.[4] H03H *9/145, 9/42, 9/64*

U.S. Cl. 333—195 **7 Claims**

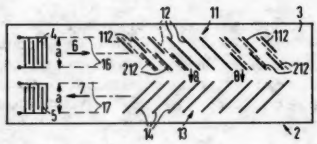
1. An electronics component operating with reflected acoustic waves on a substrate wherein a transducer is provided for inputting and/or outputting the waves relative to a reflector structure, comprising:

(a) a reflector structure formed of a plurality of reflector fingers, at least some of which are weighted;

(b) a principal path of the acoustic waves having first and second outer edges and extending along the substrate and through said reflector structure given absence of distortions in the component;

(c) a maximum anticipated deviation path of the acoustic waves occurring laterally offset to either side of said principal path given distortions and defining first and second deviated outer edges respectively outwardly of the first and second principal path edges;

(d) all reflector fingers extending at least to the first and second deviated outer edges;



(e) at least one weighted reflector finger which is divided so as to create sub-pieces offset relative to one another in a principal wave propagation direction by a dimension corresponding to a prescribed weighting;

(f) associated with said at least one divided reflector finger additional reflector finger sub-pieces which extend said divided reflector finger outwardly of the first and second edges of said principal path;

(g) a weighting division and dislocation of the divided reflector finger within the principal path being continued outwardly from the first and second edges of the principal path as an at least fundamentally periodically repeated sequence; and

(h) said continued sequence being provided at least up to said first and second deviated edges.

4,618,842

MINIATURE RELAY

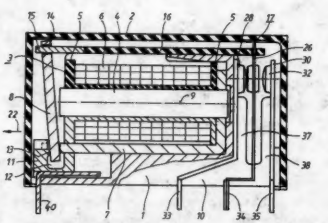
Wolfgang Nestlen, Konrad-Witz-Str. 12, Rottweil, Fed. Rep. of Germany 7210, and Gerd Schmitt, Harras 53, Wehingen, Fed. Rep. of Germany 7209

Filed Apr. 17, 1985, Ser. No. 724,017

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1984, 3414731

Int. Cl.[4] H01H *67/02*

U.S. Cl. 335—128 **13 Claims**



1. In an improved miniature relay unit having a magnet coil, a pivoting armature and a spring contact bank for said magnet coil, a spring carrier having a base portion for mounting said magnet coil, said spring contact bank having at least a pair of spring switches, said base portion having lug or solder connections for said magnet coil that extend to an outside of the unit,

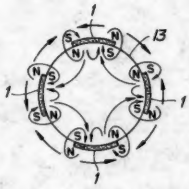
and said magnet coil having a longitudinal axis extending parallel to said base portion and in a cross relation to a longitudinal axis of said spring contact bank; the relay being further characterized by said pivoting armature having a substantially planar actuating leg of insulating material linked thereto, said leg being adapted to act on the pair of spring switches of said spring contact set, said pivoting armature being positioned along an end of said magnet coil and the spring contact bank being positioned on the opposite end of the magnet coil and said actuating leg being positioned along a side of said magnet coil and in an opposite and parallel relation with respect to said base portion.

4,618,843

ELECTRON BEAM DEFLECTION YOKE

Yukio Nakamura, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 4, 1985, Ser. No. 794,732
Claims priority, application Japan, Nov. 8, 1984, 59-235451
Int. Cl.[4] H01F 7/00
U.S. Cl. 335—210 **5 Claims**



1. An electron beam deflection yoke used for a color cathode ray tube in which a plurality of electron guns are arranged in-line fashion, which comprises of:

(a) a magnetic core;

(b) a horizontal deflecting coil for generating a horizontally deflecting magnetic field;

(c) a vertical deflecting coil for generating a vertically deflecting magnetic field;

(d) separator means for separating said two horizontal and vertical deflecting coils; and

(e) a plurality of magnetic field correcting magnets of plate shape disposed onto said separator means, said magnets being magnetized in such a way that a pair of magnetic poles are formed near both ends of said plate-shaped magnet, respectively, in a thickness direction thereof and further one magnetic polarity formed near one end thereof is opposite to the other magnetic polarity formed near the other end thereof along a longitudinal direction thereof.

4,618,844

SEMICONDUCTOR PRESSURE TRANSDUCER

Yukio Takahashi, Katsuta; Michitaka Shimazoe, and Yoshitaka Matsuoka, both of Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 12, 1983, Ser. No. 494,075
Claims priority, application Japan, May 14, 1982, 57-79867
Int. Cl.[4] G01L 1/22
U.S. Cl. 338—2 **15 Claims**

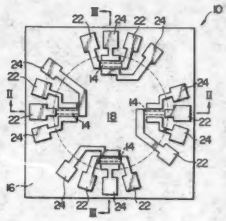
1. A semiconductor pressure transducer comprising:

a base comprising a semiconductor monocrystal;

a strain gauge resistor element formed on said base;

an oxide film formed on said base in contact with said strain gauge resistor element for protecting said strain gauge resistor element; and

a conductive layer formed on said oxide film, said layer not overlapping said strain gauge resistor element through said oxide film, being adjacent two opposed sides of said strain gauge element and functioning to cause movable



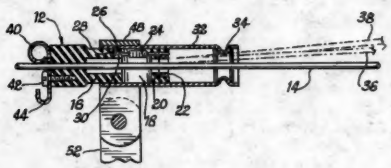
ions within and on the oxide film in proximity to the strain gauge resistor element to be fixed.

4,618,845

MULTI-MODAL PROXIMITY SENSOR SYSTEM

William J. Elks, 1310 Cary Way, San Diego, Calif. 92109

Filed Sep. 28, 1984, Ser. No. 655,561
Int. Cl.[4] B60Q 1/00; H01H 3/16
U.S. Cl. 340—61 **9 Claims**



1. A two-step proximity indicator comprising:

(a) an elongated, electrically conductive normally substantially straight probe;

(b) a probe mounting means fixing a fixed end of said probe with an extending portion of said probe extending to terminate in a distal end;

(c) said probe mounting means also mounting a primary and a secondary contact ring, said rings being axially spaced along the extending portion of said probe, such that upon increasing the deflection of said probe from straight, it contacts first said primary ring, and subsequently said secondary ring; and,

(d) an electrical alarm wired into a circuit which includes said rings and said probe such that said circuit is open until said probe touches either of said contact rings, closing said circuit to actuate said alarm, said circuit including a means therein producing a different signal from said alarm depending on which contact ring has been contacted by said probe;

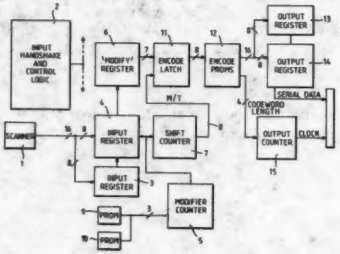
(e) said means to produce a different signal comprising a resistor wired between said primary contact and the rest of the circuit such that upon contacting said primary ring, a diminished current flows in said circuit, because of said resistor, producing a diminished signal; and,

(f) said resistor is omissible or removable with said primary ring without destroying the integrity of the circuit through said secondary contact ring.

4,618,846
DATA CODING

Peter F. Ross; Ian W. Rodgers, and Rupert L. Goodings, all of Cambridge, England, assignors to Crosfield Electronics Limited, London, England

Filed Dec. 10, 1984, Ser. No. 680,028
Claims priority, application United Kingdom, Dec. 8, 1983, 83 32771
Int. Cl.[4] H03M 7/46
U.S. Cl. 340—347 DD 10 Claims

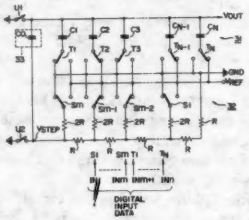


1. A method of coding signals representing a stream of digital data groups for transmission or storage, wherein each said group represents a numerical quantity, said method comprising the steps of: supplying said signals to coding means, and generating at said coding means, for each said data group, a code representing said group, said code comprising one of a terminator codeword, and a terminator codeword and at least one or more make-up codewords, wherein said terminator codewords and said make-up codewords are based on at least one multiplicative modifier.

4,618,847
C-R TYPE D/A CONVERTER

Tetsuya Iida, Yokohama, and Fuminari Tanaka, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 6, 1984, Ser. No. 586,721
Claims priority, application Japan, Mar. 8, 1983, 58-37941
Int. Cl.[4] H03K 13/02
U.S. Cl. 340—347 DA 1 Claim



1. A C-R type linear D/A converter for converting a digital word input having a predetermined number of upper and lower bits into an analog value, said converter comprising:

a first portion comprising a C-array type D/A converter for converting said upper bits into an analog value as an output, said first portion comprising a plurality of capacitors having capacitances sequentially weighted in a binary manner, first and second power source voltages, a plurality of first switches corresponding to said capacitors, said first switches responsive to said upper bits of digital input to selectively connect said capacitors to said first power source voltage or said second power source voltage;

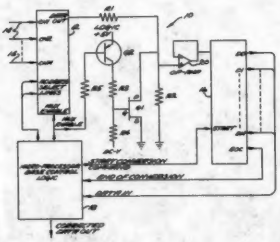
a second portion comprising an R-2R type D/A converter for converting said lower bits into an analog value as an output, said second portion comprising a plurality of R-2R type resistors and a plurality of second switches corresponding to said resistors, said second switches and said resistors being connected to said first and second power source voltages, said second switches being controlled by said lower bits of digital input to output a voltage varying in a stepwise manner between said first power source voltage and said second power source voltage; and

a capacitive coupler electrically connecting said first and second portions at said output a value corresponding to the sum of the analog values of said first and second portions.

4,618,848
ANALOG TO DIGITAL CONVERTER CIRCUIT

Steven P. Parfitt, Johnson City, Tenn., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 14, 1984, Ser. No. 681,518
Int. Cl.[4] H03M 1/10
U.S. Cl. 340—347 CC 6 Claims



3. In a circuit for converting input analog data to digital data having a CMOS M channel multiplexer, an analog to digital converter, a buffer operational amplifier coupled between the multiplexer and the converter driving the converter and control logic means coupled to and controlling the operation of the multiplexer and converter to sequentially convert the input analog data from each of the M channels in a scan of the conversion cycles, the improvement comprising a shunt circuit having a field effect transistor with a gate, source and drain having symmetrical gate-source and gate-drain structure, the drain connected to the input of the operational amplifier, the source connected to ground and the gate connected to the control logic means, the control logic means adapted to pull the input of the operational amplifier to ground for an M+1 conversion cycle of the converter for each scan.

4,618,849
GRAY CODE COUNTER

John H. Bruestle, North Plainfield Borough, N.J., assignor to RCA Corporation, Princeton, N.J.

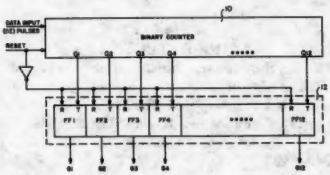
Filed Oct. 31, 1984, Ser. No. 666,721
Int. Cl.[4] H03M 1/00
U.S. Cl. 340—347 DD 6 Claims

1. The combination comprising:

an N stage binary counter having N outputs for producing a binary code at said N outputs; where N is an integer greater than one (1); and

N toggle flip-flop, each toggle flip-flop having a toggle input and an output, each one of said N toggle flip-flops being connected at its toggle input to a different one of the N binary outputs of said N stage binary counter for causing each one of said N toggle flip-flops to be responsive solely to the binary signal produced at the output of its corresponding binary counter stage, each toggle flip-flop being responsive to the signal at its toggle input and changing

state only when, said each time, the signal at its toggle input undergoes a transition from a first level to a second



level and remaining in its previous state when the signal at its toggle input makes a transition in the opposite direction.

4,618,850

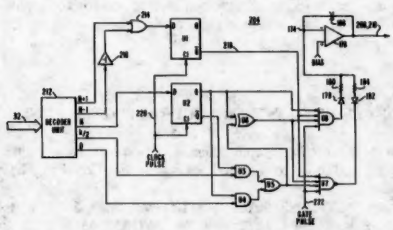
A/D CONVERTER HAVING DIGITALLY CONTROLLED SUBRANGING AND SELF ALIGNMENT APPARATUS FOR USE THEREIN

John G. Lenhoff, Jr., Linthicum, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 418,944, Sep. 16, 1982, Pat. No. 4,544,917. This application Jul. 18, 1985, Ser. No. 756,470

Int. Cl.⁴ H03M *1/10*

U.S. Cl. 340—347 CC **8 Claims**



1. A subranging analog-to-digital (A/D) converter including a quantizer which is time-shared to render multiple subranged digital word conversions of an analog signal input, each conversion dynamic subrange prealigned with the next higher conversion dynamic subrange to effect a unique set of digital conversion codes of the analog signal input value corresponding to the conversion transition region between said prealigned subranges; and apparatus for each pre-aligned pair of subranged conversions for maintaining the conversion dynamic subrange alignment thereof, said apparatus comprising:

a first circuit operative to compare the pair of subranged conversions of the analog signal input value corresponding to the conversion transition region of said pair to detect an anomaly in the digital conversion codes thereof; and

a second circuit governed by said detected anomalous condition and said pair of digital conversion codes associated therewith to adjust at least one of the conversion dynamic subranges of said pair to ameliorate said anomalous conditions.

4,618,851

APPARATUS FOR REPRODUCING SIGNALS PRE-STORED IN A MEMORY

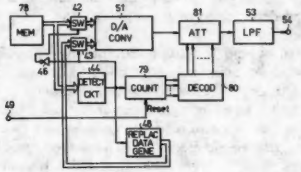
Tokumi Watanabe, Tachikawa, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 22, 1984, Ser. No. 643,065

Claims priority, application Japan, Aug. 23, 1983, 58-153669

Int. Cl.⁴ G10H *1/02, 3/03;* H03M *1/70*

U.S. Cl. 340—347 DA **9 Claims**



1. An apparatus for reproducing signals which are pre-stored in a memory, said apparatus comprising:

a memory pre-stored with signals made up of a level code and a gain change code, said level code being an original analog signal which is amplified, sampled, and digitally coded, said original analog signal being amplified to an extent such that a maximum value of the original analog signal is smaller than a full scale value in a small level region within a predetermined period, said original analog signal having a level smaller than threshold values in said small level region, said gain change code having predetermined values and replacing said level code at least for a certain period from a predetermined time in said small level region;

a detecting circuit for detecting said gain change code from a signal which is read out from said memory, and for producing an output detection signal when said gain change code is detected; and

variable gain and digital-to-analog converting means supplied with the signal read out from said memory, for producing a reproduced signal having a signal waveform which is essentially the same as the signal waveform of said original analog signal, said variable gain and digital-to-analog converting means being variably controlled of a gain thereof after receiving the output detection signal of said detecting circuit so as to attenuate the level of the signal read out from said memory to an extent complementary to the amplification performed at the time when the signal is pre-stored in said memory, and subjecting the signal read out from said memory to a digital-to-analog conversion regardless of whether the output detection signal of said detecting circuit is received.

4,618,852

MONOTONIC A/D CONVERTER WHICH MINIMIZES CIRCUITRY FOR HIGH ORDER BIT CONVERSION

Stephen H. Kelley, and Mathew A. Rybicki, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 27, 1985, Ser. No. 706,208

Int. Cl.⁴ H03K *13/08*

U.S. Cl. 340—347 AD **20 Claims**

1. A converter for providing an N bit digital output signal corresponding to an analog input signal, where N is an integer, the most significant X bits of the N bits representing a selected one of a plurality of chords defining a range of possible values of the analog input signal and the least significant (N-X) bits of the N bits representing a selected one of a plurality of steps defining a range of possible step values of the analog input signal within any one of the chords, where X is also an integer, comprising:

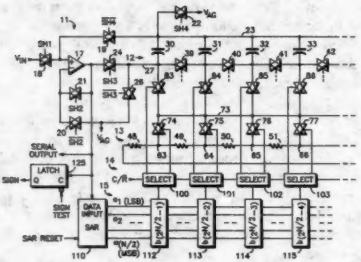
charge redistribution means for selectively storing a charge proportional to the analog input and selectively redistrib-

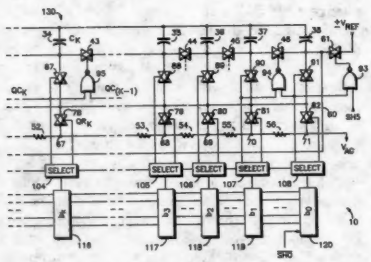
uting the stored charge in proportion to the N bits, comprising:

a plurality of capacitors having first interconnected electrodes and respective second electrodes, for selectively redistributing an amount of the stored charge corresponding to the N bits;

a C rung switching network comprising a plurality of C rung switching elements, each coupled between the second electrode of a respective one of the capacitors and a common rail, for coupling the respective one of the second electrodes to the common rail in response to a predetermined one of a plurality of first select signals; and

a C rail switching network comprising a plurality of C rail switching elements, each coupled between the second electrodes of respective successive pairs of the capacitors, for decoupling, in response to the first select signals corresponding to each successive pair of capacitors, the second electrode of a selected one of the capacitors from the second electrodes of adjacent capacitors;





voltage divider means coupled to the charge redistribution means for selectively further redistributing the stored charge corresponding to the (N-X) bits, comprising:

resistance means coupled between first and second reference voltage terminals, for developing on each of a plurality of step nodes a predetermined step voltage; and

an R rung switching network comprising a plurality of R rung switching elements, each coupled between a respective one of the step nodes and the common rail, for coupling, in response to a predetermined one of a plurality of second select signals, one of the step voltages or said first reference voltage terminal to the common rail;

a plurality of select logic means coupled to the R rung and C rung switching networks for providing the pluralities of first and second select signals, each of said select signals having a logic high or low value in response to a predetermined one of a plurality of decode control signals; and

a single one of X or one of (N-X) decoder, whichever is greater, coupled to the select logic means for providing the decode control signals in response to an approximation of the digital output signal.

4,618,853

FIRE DETECTOR

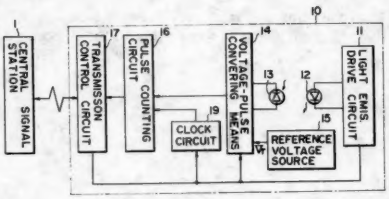
Sadataka Yuchi, Sagamihara, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed Feb. 21, 1985, Ser. No. 704,766

Claims priority, application Japan, Mar. 5, 1984, 59-41731

Int. Cl.[4] G08B *26/00*

U.S. Cl. 340—505 **4 Claims**



1. A fire detector which comprises:

a fire detecting means adapted to be actuated upon receiving a call by polling from a central signal station and to produce an output signifying a change in physical phenomena caused by fire, in the form of an analog voltage;

a voltage-pulse width converting means connected to the fire detecting means for converting the analog output voltage therefrom into a pulse of a width corresponding thereto;

means for generating clock pulses of high frequencies;

a pulse counter connected to the clock pulse and to the pulse width converting means for counting the clock pulses occurring during the duration of the pulse produced by said voltage-pulse width converting means;

means connected to the clock pulse generator for transmitting the count produced thereby to the central station in digital form

---

4,618,854

DOUBLE EYE TYPE CRIME PREVENTING SENSOR SYSTEM

Ryota Miyake, Shiga, and Masami Makino, Osaka, both of Japan, assignors to Takenaka Engineering Co., Ltd., Kyoto, Japan

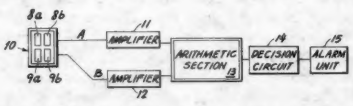
PCT No. PCT/JP83/00182, § 371 Date Feb. 3, 1984, § 102(e) Date Feb. 3, 1984, PCT Pub. No. WO83/04316, PCT Pub. Date Dec. 8, 1983

PCT Filed Jun. 3, 1983, Ser. No. 576,689

Claims priority, application Japan, Jun. 5, 1982, 96633

Int. Cl.[4] G08B *13/18*

U.S. Cl. 340—567 **4 Claims**



1. A passive double eye type crime preventing sensor system comprising:

a first pair of detection axes substantially horizontally spaced apart and extending in substantially the same direction in a predetermined space;

a second pair of detection axes substantially horizontally spaced apart and extending above or below the first pair of detection axes in the corresponding direction;

an energy focusing element including an optical mirror disposed at the terminal ends of these two pairs of detection axes for focusing radiant energy which comes in along the respective axis, said radiant energy being extreme infrared rays emitted from an object to be detected;

two pairs of radiant energy sensing elements each including a pair of pyroelectric elements of ferroelectric material disposed in the image forming position corresponding to the two pairs of detection axes in the vicinity of the focal point of the focusing element, the two pyroelectric elements comprising each pair of radiant energy sensing elements being connected in such a manner so as to produce a substantially resultant sensing output when they detect energy in a time differential fashion; and

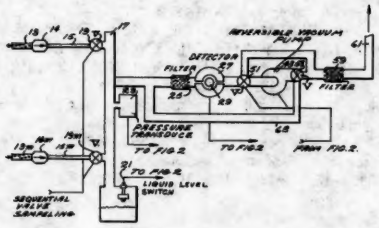
a signal processing circuit for producing a warning when two resultant sensing outputs from the pairs of radiant energy sensing elements coincide with each other in the element arranging direction, and produced in response to the detection of energy in said time differential fashion, said signal processing circuit including an arithmetic section which receives an analog resultant output signal A from the first pair of said energy sensing elements and an analog resultant output signal B from the second pair of said energy sensing elements, calculates $K(|A+B|-|A-B|)$ (where K is a constant), and, if the result of this calculation is a positive value, finds that the time differential detecting directions associated with said two pairs of sensing elements coincide with each other.

4,618,855

SOIL POLLUTION MONITORING SYSTEM

Robert C. Harding, Dallas, and Edward H. Olsen, Farmersville, both of Tex., assignors to Genelco, Inc., Dallas, Tex.

Filed Dec. 14, 1984, Ser. No. 681,575
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—605 **6 Claims**



1. A soil pollution monitoring system comprising:

a plurality of ducts for conveying air and gases;

a sensor means for detecting selected compounds in said air and gases;

means for drawing said gases and air past said sensor means;

means for sequentially connecting said sensor means to each of said ducts and applying said drawing means to draw said air and gases through said connected duct past said sensor means;

means for establishing an ambient level of said selected compounds in said gases and air;

means for comparing said detected, selected compounds with said ambient level of said selected compounds; and

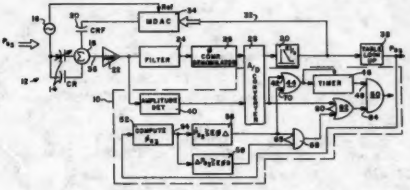
means for generating an alarm signal when the level of the detected, selected compounds exceeds said ambient level by a predetermined level.

4,618,856

STALL SURGE DETECTOR

Frank J. Antonazzi, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed May 3, 1985, Ser. No. 729,846
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—626 **11 Claims**



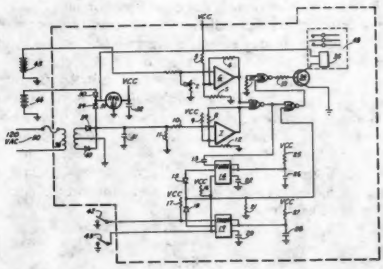
1. For use in a pressure measuring system which includes a pressure transducer for generating an instantaneous analogue signal as a function of pressure, means for generating non-linear error signal as a function of the difference between the input signal and a feedback signal and, means including feedback circuit means for generating said feedback signal as a function of said error signal for nulling said error signal and generating a digital output signal as a function of said pressure, a pressure surge detecting circuit comprising; amplitude detector means connected to said pressure measuring system to receive said error signal for generating an output signal when said error signal is equal to and greater than a predetermined magnitude; and timer means connected to receive said output signal for generating an alarm signal when said output signal continues for a predetermined period of time.

4,618,857

LOW D.C. AND LOSS OF A.C. SENSOR AND ALARM WITH SERVICE INHIBITOR

Harvey W. Dubois, P.O. Box 9568, New Iberia, La. 70560, and Fred Heselton, New Iberia, La., assignors to Harvey W. Dubois and R. J. Provost, both of New Iberia, La., part interest to each

Filed Jun. 20, 1984, Ser. No. 622,560
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—654 **11 Claims**



1. A system for monitoring the terminal voltage of a first battery and the loss of A.C. power to said system, comprising:

a. A.C. power means connected to said system;

b. means powered by said A.C. power means for providing a reference voltage to said system;

c. a second battery for powering said means for providing said reference voltage in the event said A.C. power means fails;

d. comparator means for sensing the failure of said A.C.

power means and/or the drop of said terminal voltage of said first battery below a predetermined value and producing an output signal in response thereto;

e. a timer coupled to said comparator means and having a timing cycle activated by receipt of said output signal; and

f. alarm means coupled to said timer and activated by said timer only at the end of said timing cycle, for indicating said voltage drop below a predetermined value and/or failure of said A.C. power means.

4,618,858

INFORMATION DISPLAY SYSTEM HAVING A MULTIPLE CELL RASTER SCAN DISPLAY

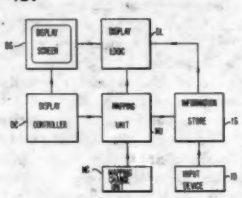
Francis R. Belch, Sale, England, assignor to Ferranti plc, Cheshire, England

Filed Nov. 3, 1983, Ser. No. 548,434

Claims priority, application United Kingdom, Nov. 3, 1982, 8231415

Int. Cl.[4] G09G 1/14

U.S. Cl. 340—724 **6 Claims**



1. An information display system capable of displaying a variable mosaic of information derived from a number of separate information items, comprising a raster scan display having a display screen, said display screen being divided into a number of cells, each cell representing a separate area of the display screen and each cell having an unique screen address; an information store comprising a plurality of storage elements and having a storage capacity for display information greater than the maximum amount of information which may be displayed on the screen at any instant and capable of storing a number of separate information items; display control means for generating the screen addresses of successive cells of the display screen; mapping means including a look-up table in the form of a random access memory containing the address of each individual storage element in the information store and responsive to the screen addresses for translating each individual screen address individually into a store address indicating the location in the information store of the information to be displayed in the cell of the display screen corresponding to the individual screen address such that each separate cell of the display may display information from any selected information item; display logic means responsive to the outputs from each successive location in the information store and operatively connected to the display to produce the necessary signals for activating the display; and map changing means connected to the mapping means for varying the translations effected by the mapping means on any desired screen address by changing the contents of said look-up table.

4,618,859

GRAPHIC DISPLAY UNIT

Yoshiaki Ikeda, Hachioji, Japan, assignor to Fanuc Ltd., Tokyo, Japan

Filed Feb. 28, 1984, Ser. No. 584,360

Claims priority, application Japan, Mar. 2, 1983, 58-32940

Int. Cl.[4] G09G 1/06

U.S. Cl. 340—724 **3 Claims**

1. A graphic display unit comprising:

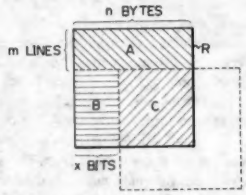
a graphic random access memory for storing data of at least one picture image,

a clock signal generating means for generating a main clock signal and a divided clock signal obtained by dividing said main clock signal,

a control means for generating a display timing signal synchronous with said divided clock signal, and

a display panel for displaying said data stored in said graphic random access memory while said display timing signal is on, characterized in that said graphic display unit further comprises a shifting means for shifting said picture-image a designated amount to a designated position on or off said display panel, said shifting means comprising:

a signal delaying means for delaying said divided clock signal and said display timing signal in accordance with a designated amount of shift of said picture image, whereby, in response to the delayed divided clock signal and the



delayed display timing signal, said data of the picture image is read from said graphic random access memory; and

a storage means for latching the designated amount of shift of said picture image, said designated amount of shift having a format consisting of high-order data expressed by m×n bytes and low-order data expressed by x bits, where m, n and x are zero or positive integers, n bytes are necessary for shifting one horizontal line on said display panel, and x bits are smaller than n bytes;

said signal delaying means having means for delaying said divided clock signal and said display timing signal by the amount of the lower bit data in said x bits, said lower bit data being smaller than one byte.

4,618,860

RADIO PAGING METHOD OF ARRANGING MESSAGE INFORMATION WITH REFERENCE TO A KEY CODE AND A BASE STATION AND A PAGER RECEIVER FOR USE IN THE METHOD

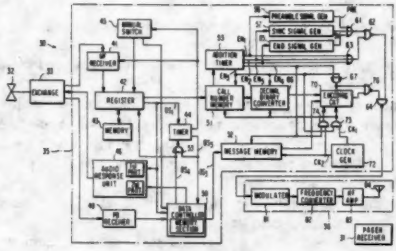
Toshihiro Mori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,681

Claims priority, application Japan, May 31, 1982, 57-92508; May 31, 1982, 57-92509; May 31, 1982, 57-80396[U]

Int. Cl.[4] G08B 5/22

U.S. Cl. 340—825.44 **18 Claims**



1. A radio paging method for use in transmitting radio calling signals from a base station to pager receivers, said radio

calling signals including message information originating from at least one subscriber station and specified by a plurality of species, said radio paging method comprising the steps of:

providing a plurality of key codes for the respective species;

receiving at said base station from a subscriber's substation a call number signal assigned to one of said pager receivers that is selected at said subscriber's substation;

requesting from said base station, in response to the received call number signal, said subscriber's substation to select one of said key codes;

receiving the selected key code at said base station;

requesting from said base station, in compliance with the received key code, said subscriber's substation to convey the message information to be transmitted to the selected one of said pager receivers;

receiving the conveyed message information at said base station; and

transmitting from said base station, as one of said calling signals, to said pager receivers said call number signal and a message signal carrying the received key code and the received message information.

4,618,861

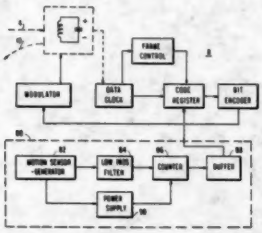
PASSIVE ACTIVITY MONITOR FOR LIVESTOCK

John W. Gettens, Ithaca, N.Y.; Nick A. Sigrimis, Halandri, Greece, and Norman R. Scott, Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Mar. 20, 1985, Ser. No. 713,946

Int. Cl.[4] H04Q *9/00*

U.S. Cl. 340—825.54 **11 Claims**



1. A detection system for an animal comprising:

a transponder mounted to the animal, said transponder including transducer means responsive to movement of the animal to generate a series of electrical pulses, first circuit means receiving said electrical pulses and generating a count indication of animal movement, second circuit means receiving said electrical pulses and storing electrical energy for driving said first circuit means, and means for storing said count together with an identification code unique to said animal,

means for interrogating said transponder to receive data therefrom; and

process means for receiving data from said interrogator means.

4,618,862

MECHANICAL DISPLACEMENT TRANSDUCER

Keiichiro Tago, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

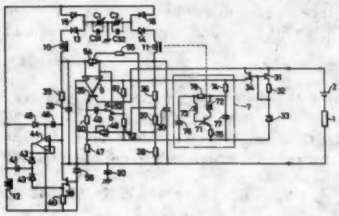
Filed Jun. 28, 1983, Ser. No. 508,755

Claims priority, application Japan, Jun. 28, 1982, 57-111243

Int. Cl.[4] G01R *11/52*; G08C *19/10*

U.S. Cl. 340—870.37 **7 Claims**

1. A two-wire displacement converter circuit for converting a minute mechanical displacement to a DC current signal, comprising: a pair of first and second AC-excited reactive impedance elements, at least one of said first and second impedance elements having an impedance variable in response to said mechanical displacement; means for supplying first and second DC current signals proportional to the impedances of said first and second impedance elements, respectively; first means for supplying an output current signal corresponding to a difference between said first and second current signals and indicative of the amount of said mechanical displacement; a



third reactive impedance element having a fixed impedance; second means for supplying a third current signal proportional to the impedance of said third impedance element; and current regulating means for maintaining a sum of said third current signal and at least one of said first and second current signals at a predetermined value.

4,618,863

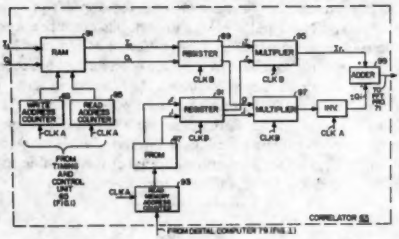
CONTINUOUS WAVE RADAR WITH RANGING CAPABILITY

John D. Collins, Burlington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sep. 29, 1983, Ser. No. 537,133

Int. Cl.[4] G01S *13/32*

U.S. Cl. 342—194 **3 Claims**



1. In a receiver for a frequency modulated CW radar wherein received signals out of a complex mixer are processed with each one of a plurality of differently delayed signals representative of the transmitted signal to produce a like plurality of differently correlated signals, each one of the received signals, the delayed signals and the differently correlated signals being a set of complex digital numbers, each one of such numbers having a real and imaginary part, a correlator comprising:

(a) means for storing a first set of complex digital numbers representative of received signals from a target;

(b) means for storing a plurality of sets of complex digital numbers, each one of such sets being representative of the complex conjugate of the transmitted signal delayed by a different amount;

(c) first multipler means, responsive to the real parts of corresponding complex digital numbers in the first set and in each one of the plurality of sets of stored complex digital numbers, for producing the product of the real parts of such complex digital numbers;

(d) second multiplier means, responsive to the imaginary parts of corresponding complex digital numbers in the

first set and in each one of the plurality of sets of stored complex digital numbers, for producing the product of the imaginary parts of such complex digital numbers;

(e) means for changing the sign of each product out of the second multiplier means; and

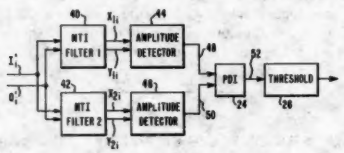
(f) means, responsive to corresponding ones of the products out of the first multiplier means and the products, with changed sign, out of the second multiplier means, for forming the like plurality of differently correlated signals.

4,618,864

RADAR CHANNEL INCLUDING AN ORTHOGONAL MTI FILTER PAIR

Raymond G. Martin, Ellicott City, and James H. Mims, Millersville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 31, 1984, Ser. No. 575,642
Int. Cl.[4] G01S *13/52*
U.S. Cl. 342—162 18 Claims



1. In a radar operating in a moving target indication (MTI) mode with frequency diversity by transmitting N+1 pulse bursts and receiving echo signalling therefrom, each pulse of the same burst enveloping a fixed carrier frequency, said radar operative to change the transmitted carrier frequency from one pulse burst to another, a radar channel for doppler processing said received N+1 pulse echo signal bursts comprising:

filtering means operative as two different MTI filters having mutually orthogonal tap weights, each having a frequency response similar to an N-pulse MTI filter, to process functionally in parallel a received N+1 pulse echo signal burst to generate a filter signal from each functional filter; and

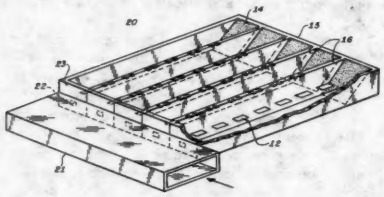
means for combining said two filtered signals non-coherently to generate a composite signal corresponding to said N+1 pulse echo signal burst for target detection.

4,618,865

DIELECTRIC TROUGH WAVEGUIDE ANTENNA

David Lamensdorf, and Chris J. Daigle, both of Middlesex County, Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Sep. 27, 1984, Ser. No. 654,716
Int. Cl.[4] H01Q *13/28*
U.S. Cl. 343—776 8 Claims



1. A dielectric trough waveguide antenna comprising:

a metal trough waveguide having first and second ends, a solid rectangular bottom, and two parallel solid rectangular walls of preselected height electrically coupled to edges of said solid rectrangular bottom;

a dielectric slab dimensioned to entirely cover said solid rectangular bottom between said parallel solid rectangular walls and having a thickness that is less than said preselected height positioned in said metal trough waveguide to form dielectric-waveguide bottom and dielectric-air interfaces;

a plurality of metallic radiating elements of predetermined dimensions, positioned on said dielectric at said dielectric-air interface with presselected spacings herebetween;

a termination at said first end of said metal trough waveguide; and

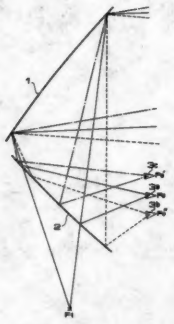
waveguide feed means at said second end for coupling electromagnetic energy into said metal trough waveguide.

4,618,866

DUAL REFLECTOR ANTENNA SYSTEM

Shigeru Makino; Takashi Katagi; Shuji Urasaki; Shunichiro Kawabata, and Yuji Kobayashi, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1983, Ser. No. 546,048
Claims priority, application Japan, Nov. 17, 1982, 57-201525
Int. Cl.[4] H01Q *19/19*
U.S. Cl. 343—779 13 Claims



1. An antenna system comprising a main reflector having a concave reflective surface for reflecting incident electromagnetic wave beams to opposite antennas;

a subreflector having a concave reflective surface disposed in facing relationship with said main reflector for reflecting said electromagnetic wave beams to said main reflector;

primary radiators disposed in positions without blocking;

said main reflector and said subreflector being disposed on the same side with respect to said primary radiators; and

said primary radiators being so positioned as to illuminate said subreflector to illuminate the same general area of said main reflector.

4,618,867

SCANNING BEAM ANTENNA WITH LINEAR ARRAY FEED

Michael J. Gans, Monmouth Beach Township, Monmouth County, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

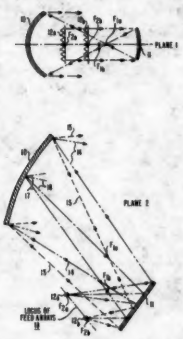
Filed Jun. 14, 1984, Ser. No. 620,722
Int. Cl.[4] H01Q *15/16, 19/19*
U.S. Cl. 343—781 P 5 Claims

1. An antenna arrangement comprising:

a main reflector capable of bidirectionally reflecting a wavefront of electromagnetic energy along a feed axis of the antenna arrangement, the main reflector being curved

along a first and second orthogonal axis on a reflecting surface of the main reflector in a first and a second orthogonal plane, respectively, to produce a first and a second focal point, respectively, at a respective separate first and a second predetermined location along the feed axis of the antenna arrangement;

a subreflector disposed on the feed axis of the antenna arrangement between the first and second focal point of the main reflector, the subreflector including a first and a second reflecting surface configuration in the first and the



second orthogonal plane, respectively, to form an image line of the first axis on the surface of the main reflector, which image line intersects a secondary focal line formed by the combination of the main reflector and the subreflector in the second plane; and

a linear phased array feed capable of launching or receiving a wavefront of electromagnetic energy, the feed being disposed on the image line of the first axis on the surface of the main reflector and lying in the first plane of the subreflector.

4,618,868

INK JET RECORDING APPARATUS

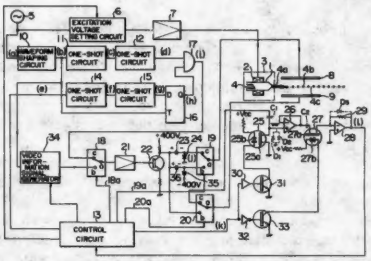
Takahiro Yamada, Ibaraki; Satoshi Namekawa, Ebina; Eiji Yoshino, and Yasumasa Matsuda, both of Hitachi, all of Japan, assignors to Hitachi, Ltd.; Hitachi Koki Co. and Hitachi Seiko Ltd., all of Tokyo, Japan

Filed Aug. 21, 1985, Ser. No. 767,350

Claims priority, application Japan, Aug. 24, 1984, 59-175057

Int. Cl.[4] G01D *18/00*

U.S. Cl. 346—75 **4 Claims**



1. An ink jet recording apparatus comprising a recording system recording an image by the combination of recording dots formed by attachment of ink droplets to a recording medium according to a video information signal and a state detecting system including means for producing charged ink droplets charged according to an ink-droplet state checking signal, a detecting electrode generating a detection signal indicative of the quantity of charge of the charged ink droplets, and means for amplifying the detection signal for detecting the state of the ink droplets on the basis of the level of the amplified detection signal, wherein said ink-droplet state detecting system comprises variable amplification means capable of changing the degree of amplification of the detection signal in said system, and an amplification-degree control signal generating circuit applying an amplification-degree control signal to said variable amplification means so as to decrease the degree of signal amplification by said variable amplification means during the period in which said ink-droplet state checking signal is generated, but to increase the degree of signal amplification by said variable amplification means during the period in which the quantity of charge of the charged ink droplets is to be detected.

4,618,869

FACSIMILE PRINT OUT SYSTEM EMPLOYING AN INK JET SYSTEM PRINTER

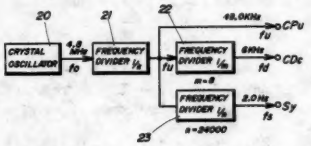
Matahira Kotani, Ikoma, and Masafumi Matsumoto, Takaichi, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 29,920, Apr. 13, 1979, abandoned. This application Oct. 29, 1981, Ser. No. 316,401

Claims priority, application Japan, Apr. 17, 1978, 53-45740

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—75 **11 Claims**



1. A facsimile print out system comprising an ink jet system printer for printing a plurality of lines, each line comprising a series of dots formed by deposit of ink droplets on a recording medium, and a control circuit for controlling the print out operation conducted by said ink jet printer, said control circuit comprising;

first means for developing a first timing signal for controlling droplet formation timing in said ink jet system printer;

second means for developing a second timing signal for controlling initiation of printing of each line formed by said printer, said second timing signal being synchronized with said first timing signal whereby formation of droplets is synchronized with initiation of printing of each line and each line is in alignment with every other line;

wherein said first means comprises means for outputting a first signal at a first frequency for controlling droplet formation; and

said second means comprises means for dividing said first frequency to obtain a second frequency and for outputting a second signal at said second frequency for controlling initiation of printing of each line.

4,618,870

DEVICE FOR COMPENSATING FOR FLUCTUATION OF INK TRANSFER IN THERMAL TRANSFER TYPE PRINTER

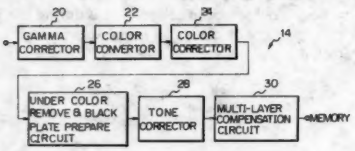
Takashi Inoue, Asaka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 4, 1985, Ser. No. 741,139

Claims priority, application Japan, Jun. 7, 1984, 59-117260; Jun. 7, 1984, 59-117261

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH 6 Claims



1. A device for compensating fluctuation in the amount of transfer of ink to a printing medium in a thermal transfer type printer which is supplied with transfer signals each of said transfer signals being indicative of a particular assigned transfer order of said signals in response to a video signal representive of an image to thermally and sequentially transfer particular kinds of thermally fusible ink which are each associated with said assigned transfer order one upon another on a printing medium, said device comprising:

transfer signal input means to which a plurality of transfer signals are supplied; and

transfer signal compensation means for outputting one of the transfer signals indicative of one of a first and a last transfer directly as a transfer signal of said one of said first and last transfer of said assigned transfer order, while outputting all other of said transfer signals as transfer signals of the orders assigned respectively to said other transfer signals after subjecting each of said other transfer signals to compensation which is representative of said particular assigned order of said transfer signals.

4,618,871

SCHOTTKY POWER DIODE

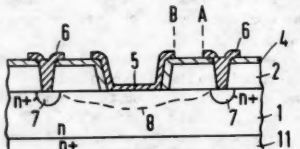
Heinz Mitlehner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 16, 1983, Ser. No. 494,698

Claims priority, application Fed. Rep. of Germany, May 25, 1982, 3219598

Int. Cl.[4] H01L *29/48, 29/04, 29/06*

U.S. Cl. 357—15 8 Claims



1. In a Schottky power diode, comprising a semiconductor substrate having a given band gap, an insulating layer disposed on said substrate, a first contact making Schottky contact with said substrate through a window formed in said insulating layer, and a semi-insulating layer disposed on said insulating layer and electrically connected to said first contact for receiving a fixed potential at a lateral distance from said first contact, said semi-insulating layer having a resistivity in the range of 10^5 and 10^{11} ohm ·cm; the improvement wherein said semi-insulating layer has a portion thereof disposed between said first contact and said substrate, said portion having a band gap which is larger than said given band gap of said substrate, said Schottky power diode further including a means for applying a substrate potential to said semi-insulating layer.

4,618,872

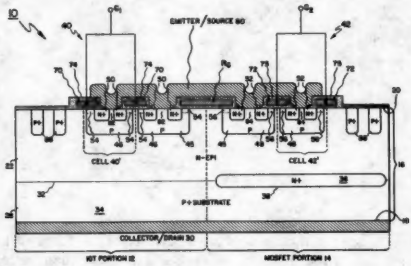
INTEGRATED POWER SWITCHING SEMICONDUCTOR DEVICES INCLUDING IGT AND MOSFET STRUCTURES

Bantval J. Baliga, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1983, Ser. No. 558,403

Int. Cl.[4] H01L *29/78, 29/74;* H03K *17/687*

U.S. Cl. 357—23.4 6 Claims



1. An integrated power switching semiconductor device comprising:

a body of semiconductor material including an insulated-gate transistor portion and an insulated-gate field-effect transistor portion, said body having first and second opposed principal surfaces on opposite sides thereof;

a first base layer of one conductivity type common to both said insulated-gate transistor portion and said insulated-gate field-effect transistor portion;

a first main terminal region adjacent said first base layer and extending to said first principal surface, said first main terminal region including at least a portion heavily-doped to a conductivity type opposite to the conductivity type of said one conductivity and defining a PN junction with said first base layer within said insulated gate transistor portion, and said first base layer and said first main terminal region including structure for avoiding bipolar conduction within said insulated-gate field-effect transistor portion;

a second base region of the opposite conductivity type and having two portions contiguous with said first base layer, one of said portions of said second base region being included in said insulated gate transistor portion and the other of said portions of said second base region being included in said insulated-gate field-effect transistor portion;

a first region of the one conductivity type being included in said insulated-gate transistor portion contiguous with said one portion of said second base region;

a second region of the one conductivity type included in said insulated-gate field-effect transistor portion contiguous with said other portion of said second base region;

a second terminal overlying at least a portion of said second base region and said first region and being in contact therewith;

a first channel region included in said insulated-gate transistor portion within said first region of the one conductivity type, and a second channel region included in said insulated-gate fieldeffect transistor portion within said second

region of the one conductivity type, said first and second regions of the one conductivity type being spaced from the respective portions of said first base layer to define the extent of the respective channel regions therebetween;

first and second gate electrodes respectively disposed over said first and second channel regions and insulatingly spaced therefrom, said gate electrodes configured for inducing, when gate voltage is applied thereto, respective conduction paths of the one conductivity type in the respective channel regions beneath the respective energized gate electrodes;

a resistance element connected between said first and second gate electrodes; and

a device gate conductor connected directly to one of said gate electrodes and to the other of said gate electrodes by said resistive element.

4,618,873

THIN FILM DEVICE

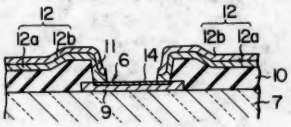
Akira Sasano, Tokyo; Kouichi Seki, Hachioji; Hideaki Yamamoto, Tokorozawa; Toru Baji, Kodaira, and Toshihisa Tsukada, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 18, 1984, Ser. No. 621,683

Claims priority, application Japan, Jun. 16, 1983, 58-106798

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.7 **13 Claims**



1. A thin film device having an amorphous silicon film formed on a substrate and a reaction layer formed by a reaction between a metal film formed on said amorphous silicon film and said amorphous silicon film, said reaction layer serving as a resistor.

4,618,874

SOLID STATE IMAGING DEVICE

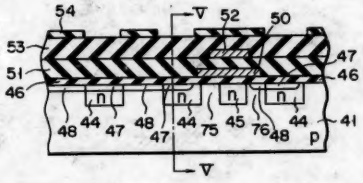
Tetsuo Yamada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,899

Claims priority, application Japan, Sep. 7, 1983, 58-164855

Int. Cl.⁴ H01L *27/14, 31/00*

U.S. Cl. 357—30 **2 Claims**



1. A semiconductor device in a solid state imaging device comprising:

a semiconductor layer of a first conductivity type; one or more photo-electro converting elements, of a second conductivity type, formed in said semiconductor layer, said converting elements being arranged in a predetermined pattern;

one or more charge transfer elements, of said second conductivity type, formed in said semiconductor layer, said charge transfer elements transferring charges generated in said converting elements; and

one or more further elements of said first conductivity type for suppressing the flow of dark current through the surface of said semiconductor layer, said further elements being formed in said photo-electro converting elements and in the separating region defined therebetween, said further elements having an impurity concentration higher than that of said semiconductor layer.

4,618,875

DARLINGTON TRANSISTOR CIRCUIT

Peter Flohrs, Reutlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

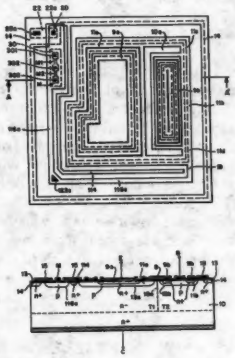
PCT No. PCT/DE82/00234, § 371 Date Aug. 8, 1983, § 102(e) Date Aug. 8, 1983, PCT Pub. No. WO83/02528, PCT Pub. Date Jul. 21, 1983

PCT Filed Dec. 30, 1982, Ser. No. 525,031

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1982, 8201186[U]; Jul. 23, 1982, 3227536

Int. Cl.⁴ H01L *27/02, 29/34;* H03K *3/26*

U.S. Cl. 357—46 **12 Claims**



1. An external-field-insensitive Darlington transistor circuit, with adjustable junction breakdown voltage, having a power transistor (T1) and having a driver transistor (T2), the collector of which driver transistor is connected to the collector of the power transistor (T1) and the emitter of which driver transistor is connected to the base of the power transistor (T1), and in which circuit the power transistor (T1) and the driver transistor (T2) are monolithically integrated by a planar process in a common substrate (10) forming the collector zones of the two transistors (T1, T2),

wherein a first (11*a*) and a second zone (11*b*) are diffused into the substrate (10) from a main surface, the substrate (10) having a specified conductivity type and the first (11*a*) and second (11*b*) zones having the opposite conductivity type, said first and second zones (11*a*, 11*b*) respectively forming with the material of the substrate (10) a first (12*a*) and a second (12*b*) p-n junction and the base zones of the two transistors (T1, T2),

wherein, from the same main surface of the substrate (10), an emitter zone, having the same conductivity type as the basic material of the substrate (10) but a higher concentration of impurities, is diffused into each of said first and second base zones (11*a*, 11*b*), said emitter zones serving as the emitter zones (9*a*, 9*b*) of the respective transistors, and

wherein a substantially non-conductive passivation layer (13) covering this same main surface of the substrate (10), except for contact windows, is provided, comprising

a further annular zone (**14**), serving as a stop ring, diffused into the substrate (**10**) from the same main surface around the first (**11***a*) and second (**11***b*) base zones, said annular stop ring zone (**14**) having the same conductivity type as the basic material of the substrate (**10**) but a higher concentration of impurities;

a metal coating, serving as a cover electrode (**15**) and as a shield against external electric fields, applied atop the passivation layer (**13**), said metal coating (**15**) extending over a region between the base zones (**11***a*, **11***b*) and the annular stop ring zone (**14**), and overlapping not only the annular stop ring zone (**14**), but also portions of the base zones (**11***a*, **11***b*) adjacent to the annular stop ring zone (**14**), and

a voltage divider (**16**) monolithically integrated with said power (T1) and driver (T2) trransistors in said circuit, for adjusting the potential of the cover electrode (**15**) to a value dependent upon the desired breakdown voltage of the first and second p-n junction (**12***a*, **12***b*), which value falls in a range defined by the potential of the first base zone (**11***a*) and the potential of a portion of the substrate (**10**) located outside the first (**11***a*) and second (**11***b*) zones and having a conductivity type opposite from that of the first (**11***a*) and second (**11***b*) base zones, said voltage divider (**16**) including a voltage divider resistor (**16***a*) and a tap (**16***b*), and

wherein the tap (**16***b*) is connected to the cover electrode (**15**),

the first end (**19**) of the voltage divider resistor (**16***a*) is connected with one of the first zone (**11***a*) and the second zone (**11***b*), and the second end (**20**) of the voltage divider resistor (**16***a*) is connected on a surface of said integrated circuit with a portion of the substrate (**10**) located outside the first (**11***a*) and second (**11***b*) zones, which portion has a conductivity type opposite from that of the first (**11***a*) and second (**11***b*) zones,

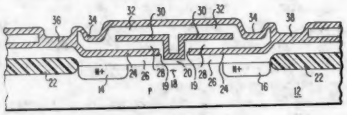
whereby said breakdown voltage can be adjusted, after fabrication of said integrated circuit, by varying where, on the surface thereof, one of said ends of said voltage divider resistor (**16***a*) is connected.

4,618,876

ELECTRICALLY ALTERABLE, NONVOLATILE FLOATING GATE MEMORY DEVICE

Roger G. Stewart, Neshanic Station, and Alfred C. Ipri, Princeton, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 23, 1984, Ser. No. 633,188
Int. Cl.[4] H01L *29/34*
U.S. Cl. 357—54 **5 Claims**



1. In a floating gate memory device of the type including a body of semiconductor material of a first conductivity type having first and second doped regions of a second conductivity type formed in the semiconductor body at the surface thereof, the first and second doped regions spaced one from the other to define a channel region therebetween in the semiconductor body for supporting current flow between the doped regions, a first conductive layer insulated from the body of semiconductor material and a second conductive layer positioned over both the channel region and the first conductive layer and insulated therefrom, the improvement comprising:

the first conductive layer being discontinuous, one portion thereof positioned over and extending from a point at least over the first doped region toward an end terminating over the channel region, another portion thereof positioned over and extending from a point at least over the second doped region toward an end terminating over the channel region;

the ends of both portions defining a slot therebetween aligned with the channel region;

the second conductor layer positioned over corresponding portions of the first conductive layer and extending into slot defined by the ends of the portions, for coupling to the channel region; and

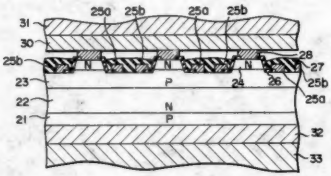
means for electrically connecting said portions of said first conductive layer together.

4,618,877

POWER SEMICONDUCTOR DEVICE WITH MESA TYPE STRUCTURE

Youichi Araki, Yokohama, and Yoshinari Uetake, Sagamihara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 682,838
Claims priority, application Japan, Dec. 21, 1983, 58-239644
Int. Cl.[4] H01L *29/06*
U.S. Cl. 357—56 **5 Claims**



1. A power semiconductor device of mesa type structure having a semiconductor element surface formed with a mesa type groove and a gate electrode formed on the bottom of the groove and covered on an exposed surface thereof with an insulator, wherein

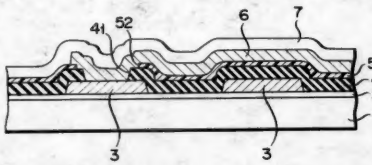
said electrode is divided into two and spaced apart to be disposed only at both peripheries of the groove bottom, and an insulator is filled between the spaced electrodes.

4,618,878

SEMICONDUCTOR DEVICE HAVING A MULTILAYER WIRING STRUCTURE USING A POLYIMIDE RESIN

Masaharu Aoyama, Fujisawa; Masahiro Abe, Yokohama; Takashi Ajima, Kamakura, and Toshio Yonezawa, Kitakyushu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Jun. 15, 1984, Ser. No. 621,086
Claims priority, application Japan, Jun. 18, 1983, 58-108558
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—71 **7 Claims**



1. A semiconductor device having a multilayer wiring structure which comprises a semiconductor substrate, a first wiring layer deposited on said substrate, and a second wiring layer deposited on said first wiring layer with an insulating interlayer disposed therebetween, wherein said insulating interlayer consisting essentially of an inorganic insulating layer as an underlying layer and a polyimide-based resin film as an overlying

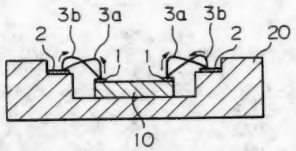
layer, wherein said inorganic insulating film has a thickness falling within a range between 0.5 μm and 1.5 μm, the ratio of a thickness of said polyimide-based resin film to that of said inorganic insulating film falling within a range between 0.1 and 0.5.

4,618,879

SEMICONDUCTOR DEVICE HAVING ADJACENT BONDING WIRES EXTENDING AT DIFFERENT ANGLES

Masataka Mizukoshi, Kokubunji, and Teiichi Endo, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 18, 1984, Ser. No. 601,360
Claims priority, application Japan, Apr. 20, 1983, 58-070558
Int. Cl.⁴ H01L *23/48, 23/50*
U.S. Cl. 357—74 **8 Claims**



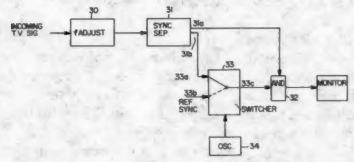
1. A semiconductor device comprising:
a semiconductor chip;
a plurality of chip electrodes formed on said semiconductor chip and having electrode surfaces;
a package for housing said semiconductor chip;
a plurality of package electrodes formed on said package and having electrode surfaces; and
wires for respectively bonding to said plurality of chip electrodes and said plurality of package electrodes, each of said wires having first and second ends, the angle of said first end with respect to the electrode surface of one of the chip and package electrodes to which the wire is bonded being substantially larger than the angle of said second end with respect to the electrode surface of the other of the chip and package electrodes to which the wire is bonded, said wires being disposed side-by-side so that one of said first and second ends of each wire is bonded to one of said chip electrodes, and the other of said first and second ends is bonded to one of said package electrodes, said wires being arranged so that said first ends are alternately bonded to one of said chip electrodes and one of said package electrodes.

4,618,880

METHOD AND APPARATUS FOR SYNCHRONIZING A PLURALITY OF TELEVISION SIGNALS

H. George Pires, 20 Surrey La., Parlin, N.J. 08859

Filed Mar. 12, 1984, Ser. No. 588,393
Int. Cl.⁴ H04N *17/04, 5/073*
U.S. Cl. 358—10 **10 Claims**



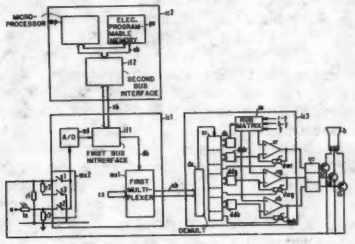
1. Method for synchronizing an incoming television signal having incoming synchronization signals to a reference television signal having reference synchronization signals, comprising the steps of
substituting said reference synchronization signals for said incoming synchronization signals at a selected rate and for selected time intervals, thereby creating a test signal;
applying said test signal to a television monitor thereby creating a visual monitor output signal, said selected rate and time intervals being adapted to create a constant flicker in said monitor output signal in response to lack of synchronization between said incoming synchronization signals and said reference synchronization signals; and
adjusting the phase of said incoming synchronization signals to remove said flicker from said monitor output signal.

4,618,881

SET OF THREE INTEGRATED CIRCUITS FOR DIGITAL VIDEO SIGNAL PROCESSING IN COLOR-TELEVISION RECEIVERS

Laürin C. Freyberger, Bahlingen, Fed. Rep. of Germany; Daniel Mlynek, Wolfgantzen, France, and Friedrich Schmidtpott, Gundelfingen, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 465,697, Feb. 10, 1983, Pat. No. 4,523,222. This application Mar. 26, 1985, Ser. No. 716,338
Claims priority, application European Pat. Off., Feb. 27, 1982, 82101519.5
The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.
Int. Cl.⁴ H04N *9/68*
U.S. Cl. 358—27 **5 Claims**



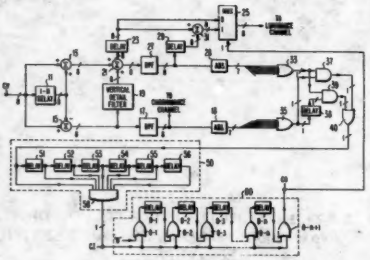
1. Circuitry for digital video signal processing in color television receivers or the like, comprising:
video codec circuits including a plurality of analog amplifiers each adopted to drive an electron gun of a picture tube via a video output stage;
circuit means coupled to each said electron gun for providing measured data corresponding to the cathode currents of said picture tube under predetermined conditions flowing in each said electron gun;
microprocessing means utilizing said measured data and predetermined data to derive operating data for said picture tube, said video codec circuits being responsive to said operating data to adjust the operating points and the gains of said plurality of analog amplifiers to adjust the dark currents and white levels, respectively;
said circuit means including: an analog to digital converter, a multiplexer for selectively coupling the input of said analog-to-digital converter to each said electron gun in successive vertical blanking intervals to provide said measured data.

4,618,882

DIGITAL CORRELATION INDICATOR AND HANGING DOT REDUCTION SYSTEM EMPLOYING SAME

Leopold A. Harwood, Bridgewater; Danny Chin, Plainsboro, and Kirk A. Law, East Windsor, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 18, 1985, Ser. No. 724,555
Int. Cl.[4] H04N 9/64, 7/18
U.S. Cl. 358—31 10 Claims



1. In a video signal processing apparatus including a source of a first digital signal of "m" bits representative of a first bipolar signal component, and a second digital signal of "m" bits representative of a second bipolar signal component, a digital correlation indicator comprising:

first logic circuit means, responsive to only the "k" most significant bits of said first digital signal, where "k" is less than "m", for outputting a "1" whenever said first digital signal is representative of an excursion of said first bipolar signal component, in either a positive or a negative direction, which equals or exceeds a threshold determined by the "k'th" most significant bit of said first digital signal;

second logic circuit means, responsive to only the "j" most significant bits of said second digital signal, where "j" is less than or equal to "m", for outputting a "1" whenever said second digital signal is representative of an excursion of said second bipolar signal component, in either a positive or a negative direction, which equals or exceeds a threshold determined by the "j'th" most significant bit of said second digital signal;

an "and" gate having two inputs, one responsive to the output of said first logic circuit means and the other responsive to the output of said second logic circuit means and

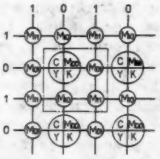
correlation indication signal developing means responsive to the output of said "and" gate.

4,618,883

METHOD OF EDITING IMAGE SIGNAL

Takashi Sakamoto, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Kyoto, Japan

Filed Mar. 13, 1985, Ser. No. 711,445
Claims priority, application Japan, Apr. 5, 1984, 59-69826
Int. Cl.[4] H04N 1/46
U.S. Cl. 358—78 2 Claims



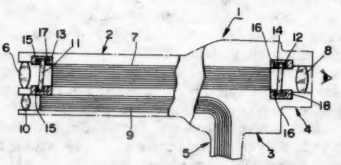
1. A method of editing image signal comprising a step of establishing a plurality of picture elements adjacent to one another on a color original picture to be an unit region of condense, a step of performing condense of image signal so that a representative picture element of said unit region of condense may have all of a plurality of image signals substantially corresponding to color signals required when reproducing the color picture image and that each picture element other than the representative picture elements may have only an image signal substantially corresponding to the brightness signal of said plurality of image signals, and a step of performing editing and rearrangement of image signal using the image signal condensed in said step, in combination with a step of establishing said unit region of condense to be a minimum unit for designation of coordinate position in the editing, and a step of performing the rearrangement of each image signal by the unit region of condense based on the layout designation under the same coordinate system as the editing.

4,618,884

IMAGE PICKUP AND OBSERVATION EQUIPMENT FOR ENDOSCOPE

Tatsuo Nagasaki, Musashino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 647,214
Claims priority, application Japan, Sep. 5, 1983, 58-163587
Int. Cl.[4] A61B 1/04, 1/06
U.S. Cl. 358—98 5 Claims



1. Image pickup and observation equipment for an endoscope which has an optical observation system to make it possible to observe the image of a subject formed on the image-forming face in the image-forming optical system using the eye lens optical system via fiber bundle, characterized in that it is provided with a driving means to vibrate at least part of the image-forming optical system of the endoscope using the said optical observation system by the amount to meet the pitch of the arrangement of the fibers on the image-forming face.

4,618,885

ELECTROMAGNETIC NOISE PREVENTIVE MEANS FOR AN ENDSCOPE WITH SOLID STATE IMAGE PICKUP ELEMENT

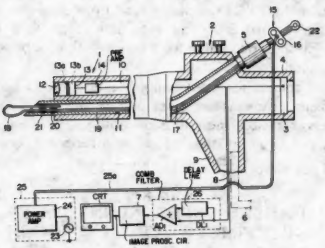
Tatsuo Nagasaki, Musashino, and Hiroyoshi Fujimori, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,513
Claims priority, application Japan, Sep. 5, 1983, 58/163600
Int. Cl.[4] A61B 1/04, 17/39
U.S. Cl. 358—98 3 Claims

1. A noise eliminating device for an endoscope having a current source means for actuating a high frequency scalpel and an image indicating means for displaying image signals from a solid state image pickup element in the endoscope, said noise eliminating device comprising:

an adjusting means for adjusting the spectrum of the high frequency current of said current source means for said high frequency scalpel, wherein said adjusting means adjusts the frequency band of the high frequency current to coincide with an image signal band, and the frequency spectrum of the high frequency current overlaps with the frequency spectrum of a driving pulse for reading an

image signal from said solid state image pickup element, and wherein the frequency of the driving pulse for reading the image signal from said solid state image pickup element corresponds to an integral multiple of an image horizontal frequency f_H; and



a comb filter means coupled to said image indicating means for removing high frequency noise generated by said current source means from the image signal of said solid state image pickup.

4,618,886

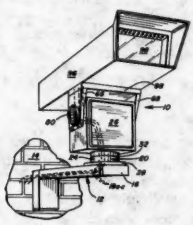
SURVEILLANCE CAMERA MOUNT

Paul C. Mooney, Northbrook, Ill., assignor to Quick-Set Incorporated, Northbrook, Ill.

Filed Jun. 19, 1985, Ser. No. 746,444

Int. Cl.[4] H04N 5/225

U.S. Cl. 358—108 **12 Claims**



1. A surveillance camera mount capable of providing multiple and variable selectable viewing vistas for a camera mounted thereon, comprising:

a base having mated lower and upper parts,

the lower part having a base flange with means for securing the lower part to a stationary member to secure the mount and a planar bearing surface across the top thereof generally parallel to the flange,

the base upper part having a vertical cylindrical body secured to the lower part centrally of said bearing surface so as to leave an annular bearing surface portion exposed about the body, and further having an outwardly extending flange generally parallel to and spaced from said bearing surface,

both base parts having walls defining a hollow central passage through the base from top to bottom;

a hollow housing of relatively box-like configuration having a lower, inwardly extending bearing flange engaging said base bearing surface, said bearing flange further having an upper surface in close proximity below said base upper part flange and a cylindrical surface closely mating with the cylindrical body of said base upper part to rotatively secure said housing to said base;

means defining enlarged openings through opposite sides of the housing, said openings being cylindrical and substantially aligned horizontally;

a pair of upstanding tilt arms, each arm having a bearing part entering and filling said housing enlarged openings and a body portion extending above the housing;

a platform secured to the arm body portions to provide unitary movement of arms and platform, said platform being adapted to support a camera housing thereon;

means forming cable passages through the platform and through the interior of at least one of said tilt arms and bearing parts exiting to the interior of the hollow housing so that camera cables may be lead through the mount to a camera housing on the platform;

means for holding said tilt arms in a selected position relative to said housing; and

means for securing said housing in a selected position relative to said base.

4,618,887

METHOD AND APPARATUS FOR REPRESENTING ULTRASONIC ECHO SIGNALS ARRIVING IN POLAR COORDINATES

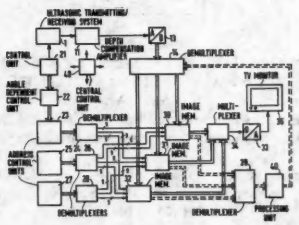
Adalbert Birk, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 14, 1984, Ser. No. 589,656

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1983, 3308995

Int. Cl.[4] H04N 7/01, 7/18

U.S. Cl. 358—112 **9 Claims**



1. A method for representing in real-time ultrasonic echo signals sequentially arriving in polar coordinates obtained by a sector scan technique, each of selected pluralities of said ultrasonic echo signals corresponding to an ultrasonic echo image comprising the steps of:

geometrically correctly alternatingly entering said ultrasonic echo images in at least two two-dimensional image memories for intermediate storage therein, each said intermediate memory accepting and storing a complete ultrasonic echo image;

reading out a previously-stored complete ultrasonic echo image from one of said image memories in a manner conforming to television standards simultaneously as another ultrasonic echo image is being entered in another of said image memories; and

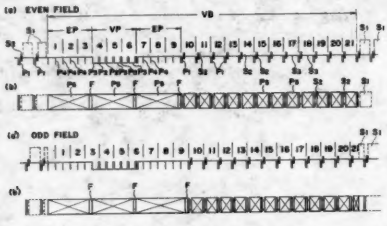
displaying the read out ultrasonic echo image on a television display means.

4,618,888

SCRAMBLING SYSTEM OF TELEVISION SIGNAL

Kazunori Nohara, Moriguchi; Katsuo Tanmatsu, Katano; Nobukazu Hosoya, Nara, and Takeshi Higashino, Daito, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 17, 1984, Ser. No. 581,158
Claims priority, application Japan, Feb. 18, 1983, 58-26485
Int. Cl.[4] H04N 7/167
U.S. Cl. 358—120 14 Claims



1. A scrambling system for a television signal including horizontal sync pulses and having a vertical blanking period which includes a vertical sync pulse period and first and second equalizing pulse periods before and after said vertical sync pulse period, said system comprising:

means for eliminating vertical sync pulses in said vertical sync pulse period and equalizing pulses in said first and second equalizing pulse periods;

means for inserting substitute pulses in said vertical sync pulse period and in said first and second equalizing pulse periods with a plurality of framing code time periods between said substitute pulses remaining unoccupied by said substitute pulses, said substitute pulses having a frequency equal to an integral multiple of the frequency of said horizontal sync pulses; and

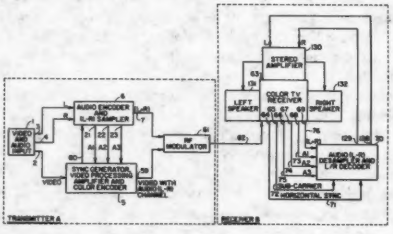
means for inserting a framing code in each of said framing code time periods, said framing code being in the form of binary code pulses connected to said substitute pulses with no break in continuity and carrying information of how the television signal is scrambled.

4,618,889

VIDEO COLOR TRANSMISSION SYSTEM WITH INDEPENDENT AUDIO SIGNALS WITHIN THE VIDEO SIGNALS

Dennis Berde, Plainview, and Edward Youskites, Melville, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 439,165, Nov. 4, 1982, abandoned. This application Jun. 26, 1985, Ser. No. 748,759
Int. Cl.[4] H04N 7/04
U.S. Cl. 358—144 22 Claims



1. A video color transmission system, comprising

transmitter means for producing video and audio signals and transmitting said signals, said transmitter means including encoding means for encoding stereo audio signals with the video signals, said encoding means comprising an audio encoder for converting left and right microphone stereo audio signals L and R to a sum audio signal (L+R) of said left and right signals and a difference audio signal (L−R) of said left and right signals and (L−R) sampler means for sampling said difference audio signal (L−R) at a rapid rate, said (L−R) sampler means providing three samples within a horizontal time rate of 63.5 microseconds and said samples providing for a bandwidth of substantially 15 kHz; and

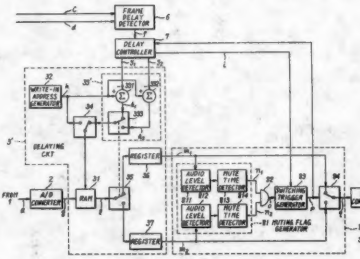
receiver means for converting signals received from said transmitter means to a color picture and stereo sound, said receiver means including decoding means for deriving said stereo audio signals from said received signals.

4,618,890

DIGITAL AUDIO SYNCHRONIZING SYSTEM WITH MUTE TIME SWITCHING FUNCTION

Toshitake Kouyama, and Ryoji Katsube, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jan. 21, 1986, Ser. No. 820,952
Claims priority, application Japan, Jan. 22, 1985, 60-8425
Int. Cl.[4] H04N 5/04
U.S. Cl. 358—149 12 Claims



1. A digital audio synchronizing system for synchronizing an audio signal accompanying an input composite video signal to a reference composite video signal to which said input composite video signal should be synchronized, said digital audio synchronizing system comprising:

delay detecting means for detecting a video delay between said input and said reference composite video signals to produce a video delay signal representative of said video delay;

first means responsive to a control signal for storing said video delay signal as a stored delay signal to produce said stored delay signal as a first delay data signal representative of a first delay which said video delay signal has when stored in said first means;

second means for producing said video delay as a second delay data signal;

encoding means for encoding said audio signal into an input digital audio signal;

delaying means responsive to said first and said second delay data signals for delaying said input digital audio signal to produce first and second delayed digital audio signals which have said first delay and said video delay relative to said input digital audio signal, respectively;

producing means for producing said first delayed digital audio signal as an output digital audio signal;

muting flag generating means responsive to said first and second delayed digital audio signals for generating first and second muting flag signals when said first and said second delayed digital audio signals are at a predetermined muting level, respectively;

muting coincidence detecting means for detecting coinci-

dence between said first and said second muting flag signals to produce a muting coincidence signal; and

control signal generating means for generating said control signal in response to said coincidence signal.

4,618,891

REFERENCE TIME DETECTING CIRCUIT

Hisafumi Yamada, Tokyo; Choei Kurik, Urawa, and Junya Saito, Wako, all of Japan, assignors to Sony Corporation, Tokyo, Japan

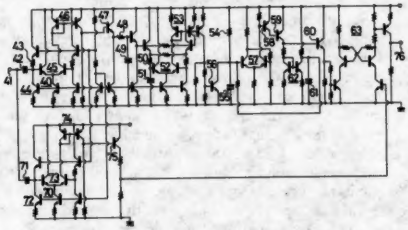
PCT No. PCT/JP82/00417, § 371 Date Jun. 20, 1983, § 102(e) Date Jun. 20, 1983, PCT Pub. No. WO83/01553, PCT Pub. Date Apr. 28, 1983

PCT Filed Oct. 21, 1982, Ser. No. 515,044

Claims priority, application Japan, Oct. 23, 1981, 56-169907

Int. Cl.⁴ H04N *5/05, 5/93*

U.S. Cl. 358—153 **3 Claims**



1. A reference time detecting circuit for a video signal having a video signal source for supplying a video signal including vertical and horizontal synchronizing signals, with a transit portion of a predetermined synchronizing signal being selected as a reference time point; comprising in combination, a first clamping circuit (40) connected to said video signal source, a second clamping circuit (70) connected to said video signal source, the time constant of said second clamping circuit being shorter than that of said first clamping circuit, a masking pulse generator connected to said first clamping circuit for generating a masking pulse at a time corresponding to said reference time point, and detecting means connected between said masking pulse generator and one of said clamping circuits for detecting said transit portion during said masking pulse and for obtaining a timing signal accurately corresponding to said transit portion.

4,618,892

DYNAMIC SHADING COMPENSATION FOR IR TRACKING SYSTEM

Frank M. Kawaguchi, Fountain Valley, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Mar. 25, 1985, Ser. No. 715,441

Int. Cl.⁴ H04N *5/14*

U.S. Cl. 358—163 **9 Claims**

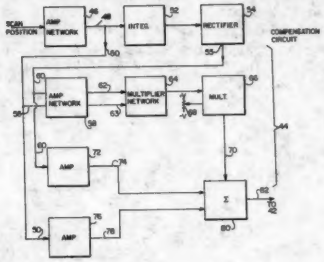
1. A circuit which compensates for display shading in an infrared tracking system, including a scanning mirror, signal post amplifiers, vidicon, and a CRT display, the circuit comprising:

amplifying means having its input connected to a signal source representative of tracking scanner position and generating a triangular signal therefrom;

integrating means connected at its input to the triangular signal for translating it to a parabolic signal;

rectifying means connected to the output of the integrating means for performing full wave rectification of the parabolic signal;

means for multiplying the triangular and rectified parabolic signals for forming a first partial compensation signal which biases the post amplifiers in a manner achieving substantial diminution of variable shading due to post amplifier gain; and



means connecting the post amplifier to the multiplying means for dynamically controlling the gain of the multiplying means as a function of the post amplifier gain.

4,618,893

NOISE REDUCING SYSTEM FOR VIDEO SIGNAL

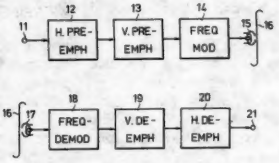
Akira Hirota, Chigasaki, and Takuya Tsushima, Ayase, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 27, 1984, Ser. No. 634,954

Claims priority, application Japan, Jul. 29, 1984, 58-138873

Int. Cl.⁴ H04N *5/213*

U.S. Cl. 358—167 **6 Claims**



1. A noise reducing system for a video signal, said noise reducing system comprising:

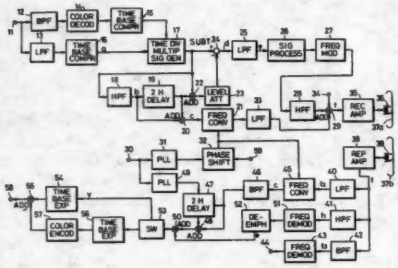
vertical pre-emphasis means supplied with an input video signal which is to be transmitted for pre-emphasizing the input video signal and transmitting a pre-emphasized video signal to a transmitting system, said vertical pre-emphasis means having such a non-linear pre-emphasis characteristic that said vertical pre-emphasis means relatively emphasizes a high-frequency component of the input video signal in a vertical spatial frequency of a picture compared to a low-frequency component of the input video signal with a degree of emphasis which decreases as the level of the input video signal increases; and

vertical de-emphasis means for receiving said pre-emphasized video signal after said pre-emphasized video signal has been transmitted through said transmitting system for de-emphasizing said pre-emphasized video signal, said vertical de-emphasis means having such a non-linear de-emphasis characteristic that said vertical de-emphasis means relatively attenuates a high-frequency component of said pre-emphasized video signal in a vertical spatial frequency of the picture compared to a low-frequency component of said pre-emphasized video signal, with a degree of attenuation which decreases as the level of said pre-emphasized video signal increases to produce a de-emphasized video output signal.

4,618,894
COLOR VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS

Yutaka Ichinoi, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Apr. 6, 1984, Ser. No. 597,708
Claims priority, application Japan, Apr. 7, 1983, 58-61293
Int. Cl.[4] H04N 5/76, 9/493
U.S. Cl. 358—310 7 Claims



1. A color video signal recording and reproducing apparatus comprising:

luminance signal producing means for producing a luminance signal which has or has not been subjected to a time base compression, between the luminance signal and a carrier chrominance signal which constitute a standard system color video signal;

time base compressed line-sequential color difference signal forming means for forming a time base compressed line-sequential color difference signal from two kinds of color difference signals which constitute the carrier chrominance signal;

a time-division-multiplexed signal generating circuit supplied with the output signal of said luminance signal producing means and the time base compressed line-sequential color difference signal from said time base compressed line-sequential color difference signal forming means, for generating a time-division-multiplexed signal in which one of two kinds of time base compressed color difference signals which constitute the time base compressed line-sequential color difference signal and the output signal of said luminance signal producing means are time-sequentially multiplexed within one horizontal scanning period;

separating means for separating a low-frequency component of the time-division-multiplexed signal from said time-division-multiplexed signal generating circuit, so as to obtain a low-frequency time-division-multiplexed signal;

a modulator for frequency-modulating a carrier by the low-frequency time-division-multiplexed signal from said separating means, so as to obtain a frequency modulated signal;

first frequency converting means for separating a high-frequency component of the time-division-multiplexed signal by use of a filter circuit, and for frequency-converting the high-frequency component to a frequency band which is lower than the frequency band of the frequency modulated signal so as to produce a low-band converted high-frequency time-division-multiplexed signal;

recording and reproducing means for recording a frequency-division-multiplexed signal on a recording medium and reproducing the frequency-division-multiplexed signal from the recording medium, said frequency-division-multiplexed signal being obtained by frequency-division-multiplexing at least the frequency modulated signal and the low-band converted high-frequency time-division-multiplexed signal;

demodulating means for obtaining a reproduced low-frequency time-division-multiplexed signal by frequency-selecting a reproduced frequency modulated signal from the frequency-division-multiplexed signal which is reproduced by said recording and reproducing means and frequency-demodulating the reproduced frequency modulated signal;

second frequency converting means for frequency-selecting a reproduced low-band converted high-frequency time-division-multiplexed signal from the frequency-division-multiplexed signal which is reproduced by said recording and reproducing means, and for frequency-converting the reproduced low-band converted high-frequency time-division-multiplexed signal back to the original frequency band so as to obtain a reproduced high-frequency time-division-multiplexed signal;

deriving means for deriving a reproduced time base compressed line-sequential color difference signal and a reproduced luminance signal which has or has not been subjected to a time base compression, from a reproduced time-division-multiplexed signal which is obtained by mixing the output signals of said demodulating means and said second frequency converting means;

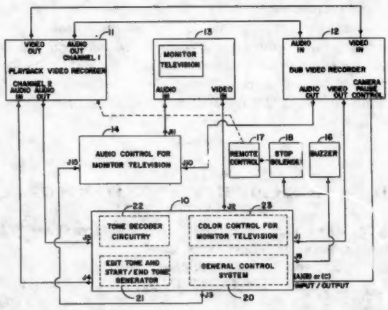
a carrier chrominance signal reproducing circuit for forming a reproduced carrier chrominance signal having a signal format which is in conformance with the standard system by subjecting the reproduced time base compressed line-sequential color difference signal from said deriving means to a time base expansion so as to return the time base to the original time base; and

a color video signal forming circuit for forming a reproduced color video signal which is in conformance with the standard system, from the reproduced luminance signal from said deriving means and the reproduced carrier chrominance signal from said carrier chrominance signal reproducing circuit.

4,618,895
VIDEO EDITING SYSTEM

Bruce R. Wright, 1006 Nana, St. Louis, Mo. 63131

Filed Aug. 31, 1983, Ser. No. 528,047
Int. Cl.[4] H04N 9/79; G11B 27/08
U.S. Cl. 358—311 22 Claims



1. The process of preparing a color video tape having an audio track for video self-editing when subsequently played across to a video recorder, comprising the steps of

playing an initial portion of such tape on a video playback machine and simultaneously viewing same on a color video monitor connected therewith, to the conclusion of a first segment selected for such subsequent duplication,

while so playing and viewing, laying down on such audio track signal means both to differentiate portions of the video tape then selected for duplication from unselected portions thereof, and to start and stop such video recorder,

so controlling, by the presence or absence of said signal means, the video input to the monitor as to delete color

from such video input simultaneously with the display on such monitor of unselected portions of the video tape, and

repeating the aforesaid steps for subsequent portions of the tape,

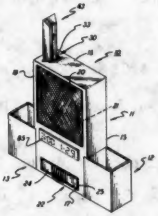
whereby, by adjusting the position at which such signal means are laid down on the audio track, the absence of color on the monitor screen indicates those portions which will be self-edited from the tape when thereafter played across to such video recorder.

4,618,896

SINGLE MESSAGE RECORDER AND PLAYBACK APPARATUS

Michael F. Rusyniak, 9 Donald Pl., Liverpool, N.Y. 13088

Filed Apr. 12, 1985, Ser. No. 722,686
Int. Cl.[4] G11B *5/00, 5/02, 25/04*
U.S. Cl. 360—1 **18 Claims**



1. A single message recording and playback apparatus that includes

a rigid elongated stick having at least one flat surface thereon,

a magnetic recording tape disposed along the flat surface of the stick for recording a message,

a guideway having a passage for slidably receiving said stick therein and directing the stick along a linear path of travel,

a drive means located along the guideway for engaging the stick and moving it along said linear path of travel,

a switch means operatively connected to said drive means, said switch positioned at the entrance to the guideway passage to automatically activate the drive means as the leading edge of the stick passes the entrance, and to automatically deactivate the drive means as the trailing edge of the stick passes through the entrance,

a combination magnetic recording and playback head positioned adjacent the guideway for contacting the magnetic tape on said stick as it moves along said path of travel to permit selective recording and playing back of messages contained thereon, and

said switch means being located a distance from the exit of said guideway that is less than the linear length of the stick whereby the leading edge of the stick extends beyond the exit of the guideway when the drive means is deactivated.

4,618,897

SYSTEM FOR SYNCHRONIZING PLURAL DATA STORAGE DEVICES TO A COMMON MASTER

Ronald R. Johnson, Shorewood, and James A. Sieben, Mound, both of Minn., assignors to IXI Laboratories, Inc., Shorewood, Minn.

Filed Feb. 11, 1985, Ser. No. 700,553
Int. Cl.[4] G11B *5/86, 15/46*
U.S. Cl. 360—15 **6 Claims**

1. A system for the mass replication of information stored on a magnetic recording medium comprising:

(1) a master station including means at said master station for generating sync pulses and means for storing the information to be replicated;

(b) a plurality of slave stations, each slave station including:

(i) drive means for moving a magnetic recording disk relative to a magnetic read/record head, said drive means or recording disk having a sensible indicia thereon;

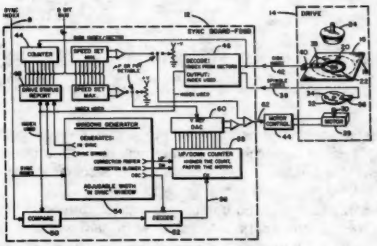
(ii) speed control means coupled to said drive means for adjusting the speed of said recording disk relative to said read/record head;

(iii) sensor means associated with said drive means or recording disk for producing an index pulse each time said indicia passes said sensor;

(c) bus means coupling said master station to each of said plurality of slave stations for transmitting said sync pulses and signals representative of the stored information to be replicated to said plurality of slave stations;

(d) synchronization circuit means including

(i) comparing means operatively coupled to receive said index pulses and said sync pulses for producing an output signal representative of the temporal spacing therebetween;



(ii) decoding means connected to the output of said comparing means for producing timing pulses at a rate proportional to said output signal of said comparing means;

(iii) bi-directional counting means coupled to said decoding means for tallying the timing pulses produced by said decoding means; and

(iv) digital-to-analog conversion means coupled to periodically convert the binary count in said bi-directional counting means to an analog signal, said analog signal being applied to said speed control means for adjusting the speed of said recording disk until said index pulses are in substantial time coincidence with said sync pulses; and

(e) sync status report means in said slave stations coupled to said bus means for signaling to said master station when the substantial time coincidence condition is obtained.

4,618,898

METHOD AND APPARATUS FOR READING A DISK

Mark S. Young, Mountain View; John Drew, Los Gatos; Michael C. Shebanow, Berkeley, and Vineet Dujari, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 20, 1984, Ser. No. 684,423
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—51 **10 Claims**

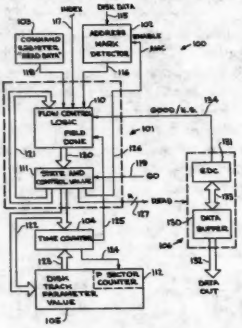
1. A method of reading a selected field from among a plurality of fields on a disk wherein said disk comprises a plurality of field address marks, each of said plurality of fields having one of said field address marks associated therewith and wherein one or more of said field address marks, other than the address mark associated with said selected field, is unreadable and said disk comprises an index mark and a spindle speed which may vary, comprising the steps of:

detecting said index mark;

generating signals for providing a first plurality of successive time windows in response to said detecting of said index mark, wherein each of said time windows is associated

with a predetermined one of said plurality of address marks and occurs at a time and has a duration within which said associated one of said address marks is expected to occur;

enabling an address mark detecting apparatus during each of said time windows for detecting an address mark which may occur within said time window;



restarting said generating step to provide another plurality of said successive time windows each time one of said address marks is detected within an associated one of said plurality of time windows; and

reading said selected one of said predetermined fields when the address mark associated with said selected field is detected within said time window associated therewith.

4,618,899

RECORD MODE DISCRIMINATION CIRCUIT

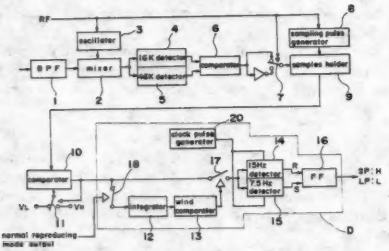
Nobuhide Doutsubo, Daito , Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jun. 19, 1985, Ser. No. 746,413

Claims priority, application Japan, Jun. 20, 1984, 59-126920; Oct. 12, 1984, 59-214952

Int. Cl.[4] G11B *15/52*

U.S. Cl. 360—73 **3 Claims**



1. In an 8 mm video including a tracking error signal circuit which outputs tracking error signals formed through comparison in the levels of particular beat components produced by the mixture of injection pilot signals and reproduction pilot signals to be obtained by a tape composed of the pilot signals for tracking use placed and recorded on the video track, and a record mode discrimination circuit which outputs a mode discrimination output for discriminating two modes of a standard record mode and a long time record mode twice as much upon counting the variation period of the tracking error signals, thereby to render to control the rotational phase of a capstan motor so as to switch the rotation speed of the capstan motor in accordance with the output of said record mode discrimination circuit, the record mode discrimination circuit comprising:

a sample hold circuit or sample holding the tracking error signals at a field period,

a comparator circuit for changing a threshold level of a reference input in accordance with a comparator output to input the sample hold output into the comparator input,

a duty identification circuit for identifying the duty cycle of said comparator output,

a mode discrimination output generating circuit for transmitting the mode discriminating output in accordance with the comparator output, and

a switching circuit for switching the duty identification circuit output in a manner that, upon identifying the duty cycle within the duty identification circuit, if the duty cycle is approximately 50, the comparator output is adapted to transmit into the mode discrimination output generating circuit, but, if the duty cycle is out of approximate 50, the comparator output is cut off not to transmit into the mode discrimination output generating circuit.

4,618,900

MAGNETIC DISK AND SPINDLE FOR DRIVING THE SAME

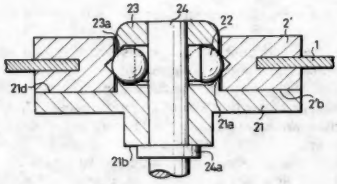
Yukio Saito, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Oct. 11, 1983, Ser. No. 540,862

Claims priority, application Japan, Oct. 8, 1982, 57-153130[U]

Int. Cl.[4] G11B *5/012, 5/82*

U.S. Cl. 360—97 **8 Claims**



1. A magnetic disk, for use in conjunction with a driving spindle having a plurality of members movable upon rotation of said spindle to project circumferentially of said spindle in a plane of rotation of said magnetic disk, comprising:

a disk-like magnetic storage medium having a center hole;

a center hub fixedly attached in said center hole of said medium, said hub having a central bore co-axial with the axis of rotation of said disk and being formed by an annular inner wall of a radius for accomodating said spindle; and

an annular groove formed as a circumferential recess in said inner wall having a depth to another radius relative to said axis of rotation larger than said radius of said inner wall of said center hub for receiving said projecting members upon rotation of said spindle to drive said magnetic disk.

4,618,901

HIGH DENSITY MAGNETIC HEAD

Iwao Hatakeyama; Yasushi Maeda; Osamu Ishii, and Shizuka Yoshii, all of Ibaraki, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,135

Claims priority, application Japan, Jul. 19, 1982, 57-124317; May 20, 1983, 58-87557

Int. Cl.[4] G11B *5/127*

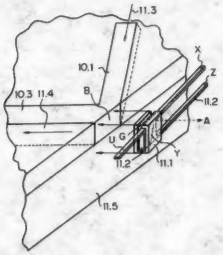
U.S. Cl. 360—114 **6 Claims**

1. A magnetic head for recording/reproducing magnetic information on a magnetic medium comprising:

(a) a thin substantially C-ring shaped magnetic core with a longitudinal gap extending generally perpendicular to the direction of travel of a recording medium which accepts leakage flux from said recording medium;

(b) detection means for detecting magnetic status in said core to provide electrical output signal; wherein

said core is small enough to have a single magnetic domain in 3 dimensions, and has a magnetization easy axis along



the C-shaped magnetic core axis perpendicular to the longitudinal direction of said gap,

said detection means is an optical detection means which projects an optical beam on said core to detect magnetic status of said core, and

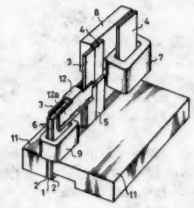
means for providing magnetic bias flux in a hard magnetization axis which is perpendicular to said magnetization easy axis.

4,618,902

MAGNETIC HEAD WITH CLAMPING ERASE BACK CORE

Toshihiro Kuriyama, Koidemachi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Jun. 30, 1983, Ser. No. 509,720
Claims priority, application Japan, Jul. 1, 1982, 57-114669
Int. Cl.[4] G11B *5/27*
U.S. Cl. 360—118 **2 Claims**



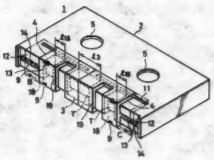
1. A magnetic head comprising a write-read layer for writing and reading data on a magnetic medium, a pair of erase layers made of magnetic material arranged on both sides of the write/read layer, and an erase back core made of a metal magnetic material and being formed with side clamping pieces resiliently joined by a coupling portion uniformly formed therebetween for clamping on both sides of said pair of erase layers, whereby said erase back core is provided to complete the flux path of the erase layers and is mounted in a clamping manner on the erase layers during assembly.

4,618,903

MAGNETIC TAPE CASSETTE

Kengo Oishi, and Masaaki Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 12, 1984, Ser. No. 649,581
Claims priority, application Japan, Sep. 16, 1983, 58-142349
Int. Cl.[4] G11B *23/02, 23/04*
U.S. Cl. 360—132 **17 Claims**



1. In a magnetic tape cassette having a cassette case housing a pair of hubs on which a magnetic tape is wound, said case having upper and lower walls and a front wall therebetween, said front wall extending in a first direction between first and second ends, said front wall having a central opening therein for receiving a magnetic head and two side openings for receiving pinch rollers and capstans, with one of said side openings being located between said central opening and said first end, and the other of said side openings being located between said central opening and said second end, the improvement wherein said magnetic tape cassette includes:

slide grooves which are formed in said upper and lower walls of said cassette case behind said central opening and side openings and extending in said first direction;

two slidable guard panels which are substantially U-shaped in cross section, each of said guard panels having a front wall with a single through-hole formed therein, each of said guard panels further having slides engaged with said slide grooves, said two slidable guard panels being slidable towards each other for closing said central opening and said side openings and slidable away from each other for exposing said central opening and said side openings; and

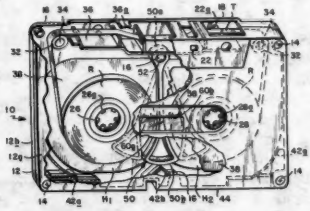
biasing means for urging said two guard panels toward each other.

4,618,904

MAGNETIC TAPE CASSETTE ISOLATOR

George H. Manning, Nashua, N.H., assignor to Memtec Corporation, Salem, N.H.

Filed Feb. 14, 1983, Ser. No. 466,015
Int. Cl.[4] G11B *23/04*
U.S. Cl. 360—132 **4 Claims**



1. In a magnetic tape cassette of the type including a generally rectangular housing having an edge, which constitutes the working edge of the cassette, formed with an aperture for

receiving a magnetic head, a pair of spaced-apart roll cores rotatively mounted to opposite walls of the housing along a line spaced parallel to said working edge, a length of magnetic tape having its opposite ends wound on the two roll cores, and a pair of guides mounted at the opposite ends of said working edge for guiding a stretch of tape from one roll core along just inside said working edge of the housing to the other roll core, the improvement comprising

A. an elongated tape isolating arm positioned between the tape cores and having one and located adjacent said cassette working edge and said arm extending substantially from said cassette working edge to the opposite edge of the housing and having opposite sides facing said cores which are concavely curved to correspond substnatially to the curvature of the largest diameter tape roll wound onto a said core;

B. means for pivotably mounting said one end of said arm to the housing whereby the arm

(1) swings freely within the housing between the two roll cores and prevents slack tape from adjacent one core from looping or twisting within the housing so that is snagged by and wound up with tape on the other roll core when the cassette is next operated, and

(2) exerts negligible drag on the rotating tape rolls when the cassette is in operation; and

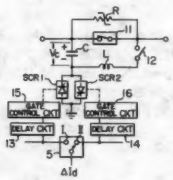
C. arcuate ribs adjacent said cassette opposite edge and extending between said opposite housing walls so as to partially extend around and help guide the tape to and from said cores, the free end of said arm just clearing segments of said ribs located between said cores.

4,618,905

DC CIRCUIT BREAKER

Shunji Tokuyama, Hitachi; Koji Suzuki, Takahagi, and Keiji Arimatsu, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 21, 1984, Ser. No. 653,051
Claims priority, application Japan, Sep. 21, 1983, 58-173039
Int. Cl.[4] H02H *7/00*
U.S. Cl. 361—4 **11 Claims**



1. A line voltage charging type DC circuit breaker for use in DC transmission system, having a series circuit connected in parallel with a commutation breaker, said series circuit being constituted by a capacitor to be charged by a line voltage, a reactor, and a circuitclosing means connected in series with each other, said DC circuit breaker comprising:

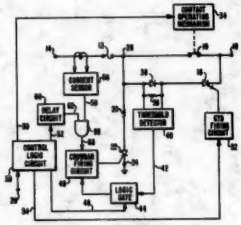
a charging circuit for charging said capacitor, said charging circuit including current direction restricting means for restricting a current flowing through said restricting means only in one direction and a reverse control means for controlling said current direction restricting means to reverse the direction of a current for charging said capacitor in accordance with a power flow reversal control of said DC transmission system.

4,618,906

HYBRID SOLID STATE/MECHANICAL SWITCH WITH FAILURE PROTECTION

Derek A. Paice, Murrysville, and Kenneth E. Mattern, Gibsonia, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 16, 1984, Ser. No. 631,357
Int. Cl.[4] H02H *3/087*
U.S. Cl. 361—5 **8 Claims**



1. A hybrid electrical switch comprising:

a pair of terminals for connection to a power line;

a branch circuit connected between said power line terminals, said branch circuit including the series connection of a circuit breaking device and a pair of mechanical contacts;

a solid state switching device electrically connected in parallel with said pair of mechanical contacts;

a crowbar circuit connected between a reference terminal and a connection point in said branch circuit located between said circuit breaking device and said pair of mechanical contacts;

means for controlling the operation of said pair of mechanical contacts and said solid state switching device such that said solid state switching device is turned on before the closure of said mechanical contacts and is turned off after said mechanical contacts open;

means for triggering said crowbar circuit when the leakage current through said solid state switching device exceeds a preselected magnitude; and

means for triggering said crowbar circuit when current flows through said circuit breaking device for a period which exceeds a predetermined duration following the expected opening time of said pair of mechanical contacts.

4,618,907

DESENSITIZED GROUND FAULT INTERRUPTER

Howard S. Leopold, Plainview, N.Y., assignor to Eagle Electric Mfg. Co., Inc., Long Island City, N.Y.

Filed Jan. 29, 1985, Ser. No. 695,965
Int. Cl.[4] H02H *3/26*
U.S. Cl. 361—45 **12 Claims**

1. In an improved ground fault interrupter for protecting an electrical power outlet operative for supplying electrical alternating current along hot and neutral lines to a load, said interrupter being of the type including:

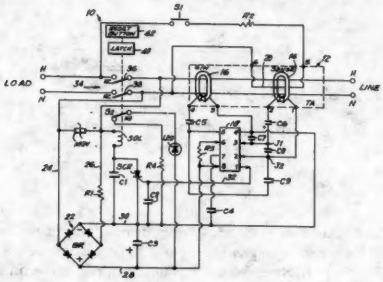
(A) means for sensing a current differential between the lines, and for generating a sense output signal indicative of the current differential, and

(B) control means operatively connected to the sensing means and energizable from an off state, said control means being operative for comparing the sense output signal to a predetermined current threshold indicative of a ground fault condition, and for interrupting the supply of current to the load when the sense output signal is at least equal to the predetermined current threshold,

wherein the improvement comprises:

means operatively connected to the control means for desen-

sitizing the same, and for maintaining the control means in a desensitized state, other than the off state, after the



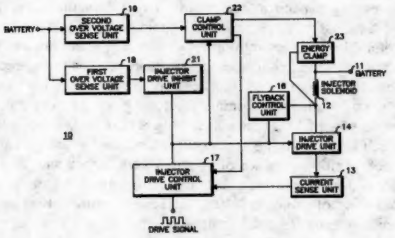
ground fault condition has been sensed and the supply of current to the load has been interrupted.

4,618,908

INJECTOR DRIVER CONTROL UNIT WITH INTERNAL OVERVOLTAGE PROTECTION

Dennis A. Anttila, Coconut Creek, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 5, 1985, Ser. No. 762,467
Int. Cl.[4] F02D *41/30*; H01H *47/32*
U.S. Cl. 361—187 **14 Claims**



1. In an injector driver circuit for use with a fuel injector solenoid and a power source, said injector driver circuit comprising current sense means for sensing current flow through said injector solenoid and for providing a current sense signal in response thereto, injector drive control means for receiving an input signal and said current sense signal and for outputting a drive signal, and injector drive means responsive to said drive signal for selectively allowing current to flow from said power source through said injector solenoid and said injector drive means, an inprovement comprising:

(a) first overvoltage sense means operably connected to said power source for detecting overvoltage conditions and for providing an overvoltage detected signal in response to detecting such an overvoltage condition; and

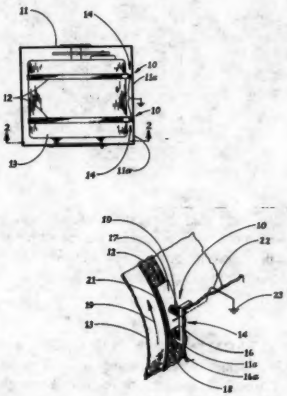
(b) injector drive inhibit means responsive to said overvoltage detected signal for inhibiting said drive signal from causing said injector drive means to allow current to flow from said power source through said injector solenoid and said injector drive means, such that injector solenoid current cannot flow through said injector drive means.

4,618,909

STATIC DISCHARGE DEVICE

James L. Sanders, 12235 Crawford Rd., Omaha, Nebr. 68144

Filed Dec. 23, 1985, Ser. No. 812,459
Int. Cl.[4] H05F *3/00*
U.S. Cl. 361—212 **7 Claims**



1. A static discharge device for use on a clothes dryer, comprising:

a continuous band of material tending to give up electrons to adjacent atoms, attached to the exterior circumference of the drum of said clothes dryer;

a contact shoe of electrically conductive material mounted on one end to an electrically insulated base attached to said dryer, and located such that a portion of one face of said shoe is in frictional contact with said band;

a layer of material tending to tear away electrons from adjacent atoms, attached to the drum-adjacent face of said shoe and having dimensions greater than the area of contact between said shoe and band; and,

a wire, electrically connecting said shoe to an independent ground, whereby electrical charges built up on said layer of material will be discharged through said shoe and wire to the ground.

4,618,910

ELECTRICAL CIRCUIT INTERRUPTER FOR DRY METALLIZED FILM CAPACITORS

Thomas F. Strange, and John W. Carino, both of Columbia, S.C., assignors to North American Philips Corporation, New York, N.Y.

Filed Oct. 25, 1984, Ser. No. 664,659
Int. Cl.[4] H01G *1/11*
U.S. Cl. 361—275 **9 Claims**

4. An electrical dry metallized film capacitor comprising:

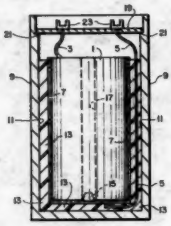
a capacitor roll section, formed from a metallized film, having a first and a second connecting lead electrically connected to a top and a bottom end, respectively, of said capacitor roll section, the capacitance of said capacitor being established between said connecting leads;

a container closed at one end thereof for receiving said capacitor roll section, said bottom end of said capacitor roll section being adjacent said closed end of said container and said second connecting lead extending along a side of said capacitor roll section to an open end of said container;

means for rigidly fixing said second connecting lead with respect to said container; and

means for holding said capacitor roll section with respect to said container allowing only axial movement thereof,

whereby, upon failure of said capacitor due to an electrical potential applied across said connecting leads, gases formed in said capacitor roll section, due to said failure,



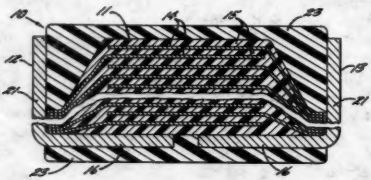
axially shift said capacitor roll section away from the closed end of said container thereby breaking the connection between the bottom end of said capacitor roll section and said second connecting lead.

4,618,911

END TERMINATION FOR CHIP CAPACITOR

Stanley W. Cichanowski, Bennington, Vt., and David G. Shaw, Glens Falls, N.Y., assignors to SFE Technologies, San Fernando, Calif.

Filed Nov. 19, 1984, Ser. No. 672,528
Int. Cl.⁴ H01G *1/13, 4/08*
U.S. Cl. 361—308 **7 Claims**



1. In a monolithic capacitor having electrode layers with the edge of adjacent electrode layers at each end of the capacitor bonded to each other and at least one of said edges bonded to an electrically conductive substrate and center portions spaced and held by dielectric material in an interleaved, multi-layer capacitor body, the improvement comprising, electrically conductive material defining a termination surface approximately equal in area to one end of said capacitor body, and said material being in intimate, electrically conducting contact with said substrate.

4,618,912

MONOLITHIC CERAMIC CAPACITOR

Yukio Sakabe; Shintaro Karaki, and Kiyoshi Nakano, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jul. 12, 1985, Ser. No. 754,393
Claims priority, application Japan, Aug. 13, 1984, 59-169579
Int. Cl.⁴ H01G *1/14, 4/12*
U.S. Cl. 361—309 **4 Claims**

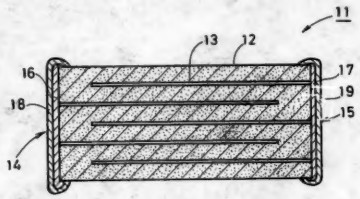
1. A monolithic ceramic capacitor comprising a sintered body obtained by laminating a plurality of ceramic green sheets and simultaneously firing the same,

said sintered body having a plurality of gaps opening in either side of a pair of end surfaces of said sintered body,

said monolithic ceramic capacitor further including:

a plurality of internal electrodes formed by injecting molten lead or lead alloy into said gaps; and

a pair of external electrodes provided on said pair of end surfaces of said sintered body for extracting the electrostatic capacity,



said external electrodes being formed of respective first layers including a fired paste mainly composed of Ni_3B and respective second layers provided on the outer sides of said first layers.

4,618,913

ELECTRICAL CAPACITOR INCLUDING A QUENCHER GAS ADDITIVE

Dieter Handtmann, Sindelfingen; Egon Mossburger, Stuttgart, and Herbert Förster, Schorndorf, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 11, 1985, Ser. No. 709,785
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411793
Int. Cl.⁴ H01G *4/22;* H01B *3/48*
U.S. Cl. 361—315 **10 Claims**

1. An electrical capacitor, preferably a non-impregnated, self-curing capacitor comprising a roll of a dielectric paper and/or plastic foil provided with metal layers applied thereon preferably by evaporation in vacuum, a housing enclosing the roll, a polyatomic additive substance in gaseous phase enclosed in the housing to fill interspaces between the metal layers of the roll, said additive substance including a hydrocarbon compound free of halogens and having a first ionization potential which is less than the ionization potential of at least a part of a decomposition product of said dielectric paper and/or plastic foil, and said additive substance being selected from a group consisting of toluene, xylene, benzene, acetone, ethyl alcohol, propane, propylene and butane.

4,618,914

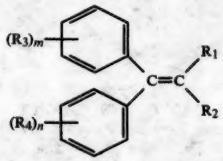
ELECTRICAL INSULATING OIL AND OIL-FILLED ELECTRICAL APPLIANCES

Atsushi Sato, Tokyo; Keiji Endo, Yokosuka; Shigenobu Kawakami, Ichikawa; Hitoshi Yanagishita, and Shozo Hayashi, both of Yokohama, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Feb. 28, 1985, Ser. No. 706,408
Claims priority, application Japan, Mar. 8, 1984, 59-44951
The portion of the term of this patent subsequent to Jan. 15, 2002, has been disclaimed.
Int. Cl.⁴ H01G *4/22;* H01B *3/22*
U.S. Cl. 361—315 **11 Claims**

4. Electrical appliances impregnated with an electrical insulating oil comprising at least one of 1,1-diarylalkenes which are represented by the following general formula (I):

(I)



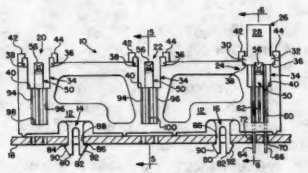
wherein R_1 to R_4's are the same or different and each of them is a hydrogen atom or an alkyl group having 1 to 5 carbon atoms, and m and n are integers from 0 to 3, inclusive.

4,618,915

SUPPORT MEMBER FOR ELECTRICAL COMPONENTS

George J. Bury, Lake Villa, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 17, 1984, Ser. No. 682,503
Int. Cl.[4] H05K 7/10
U.S. Cl. 361—400 9 Claims



9. A support member for mounting electrical components having outwardly extending flange portions to a circuit board comprising: a frame-like body portion; retention means for coupling said body portion to a circuit board in a predetermined orientation relative thereto; and a plurality of socket means for receiving and supporting electrical components in a predetermined orientation relative to said body portion; wherein each of said socket means comprises recess means formed in said body portion for receiving at least a predetermined portion of one of said electrical components, inwardly projecting finger means overlying outer edge portions of said recess means for overlying said outwardly extending flange portions of said one electrical component therein, and a resilient spring-like element integrally formed with said body portion and disposed interiorly of said recess for engaging a bottom surface of said electrical component and resiliently urging said component for positive engagement of said flange portions thereof with said inwardly extending fingers.

4,618,916

LIPID BILAYER MEMBRANE ELECTRONIC CIRCUIT COMPONENTS

Robert L. Muller, City Island, and Olaf S. Andersen, New York, both of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Dec. 18, 1984, Ser. No. 683,255
Int. Cl.[4] H01G 9/00; G11C 11/00
U.S. Cl. 361—434 30 Claims

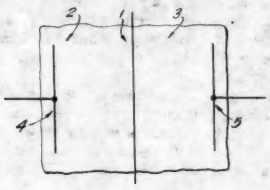
10. A circuit component comprising:

(a) a lipid bilayer membrane;

(b) a first liquid phase in contact with a first surface of the membrane, the first liquid phase comprising an ionic solution that is electrically conductive and a material that is capable of inducing voltage-dependent conductance in the membrane;

(c) a second liquid phase in contact with the second surface of the membrane, the second liquid phase comprising an ionic solution that is electrically conductive;

(d) means for inducing an electrical potential across the first liquid phase, the membrane and the second liquid phase; and



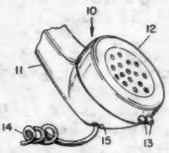
(e) means for maintaining constant the concentration of ionic charge carriers in the liquid phases.

4,618,917

INTEGRAL PHONE LIGHT ACCESSORY

Peter Lee, Monterey Park; George F. Cheung, La Mirada, and Joe T. Yee, Huntington Beach, all of Calif., assignors to American Phone Products, Anaheim, Calif.

Filed Aug. 31, 1984, Ser. No. 645,840
Int. Cl.[4] H04M 1/22
U.S. Cl. 362—88 15 Claims



1. A light device for use with existing telephone instruments comprising,

a mouthpiece transducer housing (12) adapted to detachably engage the existing handset portion (10) of a telephone instrument,

at least one aperture formed in the sidewall of said mouthpiece transducer housing,

light emitting device means (13) arranged to be mounted in the aperture in said housing, and

a wafer-like electrical conductor (30, 530) having an annulus configuration joined to said light emitting device and mounted within said mouthpiece transducer housing adjacent to the transducer and adapted to be connected with the electrical power line in the handset of the telephone instrument whereby said light emitting device selectively is activated solely by the electrical power produced in said telephone instrument.

4,618,918

UNIVERSAL FILTER CHANGER FOR THEATRICAL LIGHTS

Ilya Zhabokrug, 434 16th Ave., San Francisco, Calif. 94118

Filed Jun. 3, 1985, Ser. No. 740,528
Int. Cl.[4] F21V 9/08
U.S. Cl. 362—281 6 Claims

1. A filter changer for lighting units, comprising:

a casing,

a lighting unit,

means for attaching said casing to said lighting unit,

a set of filter holders, at least one of said filter holders containing a filter,

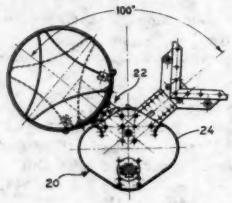
means in said casing for switching any of said filter holders between two extreme positions, said switching means

comprising a set of identical switching mechanisms, the number of said switching mechanisms corresponding to the number of said filter holders,

each switching mechanism consisting of a stationary part which is rigidly connected to said casing, a moveable part which can rotate with respect to said stationary part, and means for rotating said moveable part with respect to said stationary part,

said means for rotating said moveable part with respect to said stationary part comprising an electromagnet,

said electromagnet consisting of a first core and a second core, each core having a tail portion, each tail portion having a U-shaped slot therein,



means for fixing said moveable part with respect to said stationary part in either of said extreme positions,

said means for fixing being operably controlled by said electromagnet,

a first column being rigidly connected to said stationary part,

a second column being rigidly connected to said moveable part,

said first column being fit into said U-shaped slot of said tail portion of said first core and said second column being fit into said U-shaped slot of said second core, and

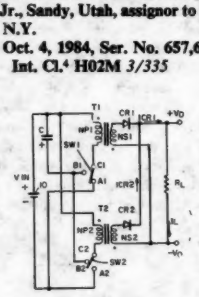
resilient means positioned between each of said columns and its respective core.

4,618,919

TOPOLOGY FOR MINIATURE POWER SUPPLY WITH LOW VOLTAGE AND LOW RIPPLE REQUIREMENTS

Hubert C. Martin, Jr., Sandy, Utah, assignor to Sperry Corporation, New York, N.Y.

Filed Oct. 4, 1984, Ser. No. 657,668
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 **13 Claims**



1. A transformer circuit comprising,

first electrical transformer means having a primary winding and a secondary winding,

second electrical transformer means having a primary winding and a secondary winding,

source means,

capacitor means,

switch means for selectively connecting at least one of said primary windings to said capacitor means to receive an electrical signal therefrom and selectively connecting each of said primary windings to said source means when said primary winding is not connected to said capacitor means, and

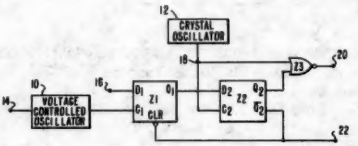
output means connected to both of said secondary windings of said first and second electrical transformer means.

4,618,920

FREQUENCY CONTROL CIRCUIT

David A. Fox, Shawnee Township, Perry County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 24, 1984, Ser. No. 613,676
Int. Cl.[4] H02M *5/45*; H03K *3/72*
U.S. Cl. 363—37 **4 Claims**



3. An electric power system comprising:

a generator for producing a DC voltage on a pair of DC-link conductors;

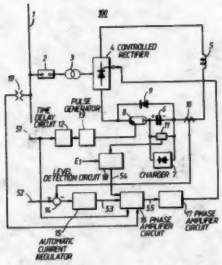
an inverter for converting said DC voltage to a multiple phase AC output, said inverter including a pattern generator, a plurality of output power poles, and means for alternatively switching said power poles between one of said DC-link conductors having a positive polarity and the other one of said DC-link conductors having a negative polarity in accordance with a signal generator by said pattern generator; and

a frequency control circuit for controlling the frequency of the output signal of said pattern generator, said frequency control circuit including an input terminal for receiving a clock signal comprising a plurality of voltage pulses which occur at a fixed frequency; a voltage controlled oscillator for producing an output signal comprising a plurality of voltage pulses which occur at a variable frequency, dependent upon an applied control voltage; first and second type D flip flop circuits; said first flip flop circuit having a data input terminal, a clock input terminal, a clear input terminal, and a Q output terminal wherein said first flip flop circuit data input terminal is connected to a preselected logic signal and said first flip flop circuit clock input terminal is connected to receive said voltage controlled oscillator output signal; said second flip flop circuit having a data input terminal, a clock input terminal, a clear input terminal, a Q output terminal and a $\overline{Q}$ output terminal wherein the data input terminal of said second flip flop circuit is connected to the Q output terminal of said first flip flop circuit, the clock input terminal of said second flip flop circuit is connected to receive said clock signal, and the $\overline{Q}$ output terminal of said second flip flop circuit is connected to the clear input terminal of said first flip flop circuit; and a logic gate having two input terminals and an output terminal wherein the Q output terminal of said second flip flop circuit is connected to one of said logic gate input terminals and the other one of said logic gate input terminals is connected to receive said clock signal such that a modified clock signal occurs on said logic gate output terminal; said modified clock signal being produced by passing the voltage pulses of said clock signal to said logic gate output terminal such that each clock signal voltage pulse which immediately succeeds a voltage controlled oscillator output signal voltage pulse is inhibited.

4,618,921
POWER SUPPLY SYSTEM AND A STARTING METHOD THEREOF

Hiroshi Ikeda, and Osamu Higa, Fuchu, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 13, 1985, Ser. No. 765,127
Claims priority, application Japan, Aug. 24, 1984, 59-176254
Int. Cl.[4] H02P 13/26; G05F 1/455
U.S. Cl. 363—49 11 Claims



1. A power supply system for supplying a load current to a load, comprising:

control rectifier means having input and output terminals for receiving an AC voltage at said input terminals and for performing bypass pair operation and current control operation based on a control signal to supply said load current from said output terminals;

first means having two terminals for charging a first voltage between said two terminals;

switch means;

said first means, said switch means and said output terminals of said control rectifier means being connected in series;

second means, connected in parallel with one of said first means and a serially connected circuit of said first means and said switch means, for flowing said load current therethrough in one direction; and

control circuit means, connected to receive a start-up command, said first voltage and said AC voltage, for producing an ON signal based on said start-up command, and for producing said control signal, based on said AC voltage and said start-up command, as a first control signal for bypass pair operation of said controlled rectifier means when said first voltage is larger than or equal to a specified voltage and a second control signal for current control operation of said controlled rectifier means when said first voltage is below said specified voltage, and for outputting said first control signal and said second control signal sequentially as said control signal;

said switch means being closed based on said ON signal from said control circuit means, and

said second means flowing said load current therethrough when said first voltage is a predetermined value.

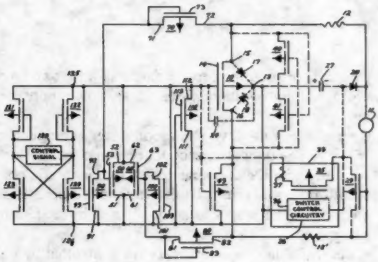
4,618,922
ISOLATED CONTROL SIGNAL SOURCE

Marc D. Hartranft, Brooklyn Park, and Thomas E. Hendrickson, Wayzata, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 141,512, Apr. 18, 1980, Pat. No. 4,319,182.
This application Nov. 16, 1981, Ser. No. 321,977
Int. Cl.[4] H02M 7/219
U.S. Cl. 363—127 3 Claims

1. A control signal source means having first and second output regions between which signals can be presented of a constant polarity upon being directed to do so by a control signal generating means, and without such a direction said first and second output regions appear to be electrically separated from one another by substantially an open circuit should a voltage source of either polarity be provided between said first and second output regions, said control signal source means comprising:

first and second unidirectional current conducting means each having therein first and second terminating regions between which in asymmetrical current conducting capability is exhibited, said first unidirectional current conducting means first terminating region being electrically connected to said control signal source means first output region, said second unidirectional current conducting means first terminating region being electrically connected to said control signal source means first output region, said first unidirectional current conducting means second terminating region being electrically connected to a first terminal means adapted for electrical connection to one of first and second output regions of said control signal generating means, said control signal generating means being capable of providing, if directed to do so, signals between said control signal generating means first and second output regions selected from both constant polarity and alternating polarity signals, said second unidirectional current conducting means second terminating



region being electrically connected to a second terminal means adapted for electrical connection to that one of said control signal generating means first and second output regions opposite that to which said first terminal means is adapted to be electrically connected connected, as aforesaid; and

first and second control signal presentation means each having first and second terminating regions and each control signal presentation means being capable of being directed by a control region therein to effectively provide a conductive path of a selected conductivity between said first and second terminating regions thereof, said first control signal presentation means first terminating region and control region each being electrically connected to a different one of said first and second terminal means, and said first control signal presentation means second terminating region being electrically connected to said control signal source means second output region, said second control signal presentation means first terminating region and control region each being electrically connected to a different one of said first and second terminal means, and said second control signal presentation means second terminating region being electrically connected to said control signal source means second output region.

4,618,923

DIRECT CURRENT TIGHT COUPLING

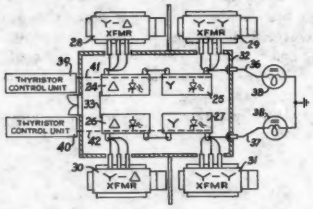
Michael Meisel, Dormitz, Austria, and Heinz Wiendl, Nuremburg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Dec. 18, 1984, Ser. No. 682,899

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1984, 3404076

Int. Cl.[4] H02J 3/36; H02M 7/00

U.S. Cl. 363—144 2 Claims



1. A d.c. short coupling for connecting a first and a second asynchronous, high-voltage, three-phase, power network comprising:

a three-phase, full-wave static converter arrangement having a Wye-connected secondary static converter transformer, and a Delta-connected secondary static converter transformer and controllable semiconductors allocated to each of the networks to be connected by said short coupling;

said controllable semiconductors are controlled by a central electronic control unit so that a network-supplying power static converter assembly functions as a rectifier and a network-receiving-power static converter assembly functions as an inverter, and the controllable semiconductors of each functional assembly are arranged in a stack pattern forming matching static converter towers connected together on the d.c. power coupling side at the same voltage polarity, and on the three-phase, a.c. power side with respective Wye-connected secondary and Delta-connected secondary sides of the static converter transformers; and

each of the two full-wave static converter arrangements has two full-wave controllable semiconductor subassemblies allocated to the Wye-connected and the Delta-connected secondary sides of the static converter transformers, each semiconductor subassembly forming a static converter tower, said four static converter towers are arranged in a rectangular pattern and assembled in such a manner that the static converter towers electrically connected to the secondary sides of the static converter transformers of one power network and the static converter towers electrically connected to the secondary sides of the static converter transformers are located next to each other, parallel to the static converter towers, and the static converter towers electrically connected to the Delta-connected secondary sides of both power networks and the static converter towers electrically connected to the Wye connected secondary sides of both power systems face each other.

4,618,924

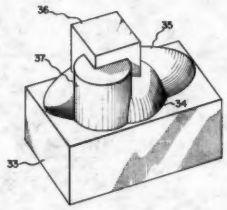
AUTOMATIC MACHINING USING CONSTRUCTIVE SOLID GEOMETRY WITH BOOLEAN COMBINATIONS OF PRIMITIVES INCLUDING TOOL OFFSETS TO FORM A MACHINING PATTERN

John K. Hinds, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 28, 1984, Ser. No. 655,185

Int. Cl.[4] G05B 9/00

U.S. Cl. 364—191 14 Claims



1. The method of machining solid parts on a machine tool having a rotating milling cutter comprising the steps of:

providing a constructive solid geometric description of a desired part expressed as a Boolean combination of primitive shapes;

determining offset primitives by offsetting every primitive shape by an amount equal to the radius of said milling cutter;

creating a description of an offset part which is a Boolean combination of said offset primitives and the result of applying the same set operations as in the initial step;

obtaining curves on the perimeter of said offset part which is the envelope of cutter positions; and

generating machine tool position commands to direct said milling cutter to follow said curves, and automatically machining the desired part.

4,618,925

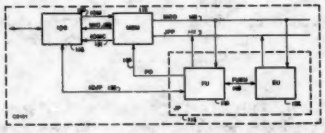
DIGITAL DATA PROCESSING SYSTEM CAPABLE OF EXECUTING A PLURALITY OF INTERNAL LANGUAGE DIALECTS

Richard G. Bratt, Wayland; Ronald H. Gruner, Cary; Thomas M. Jones, Chapel Hill, and James T. Nealon, Cary, all of N.C., assignors to Data General Corporation, Westboro, Mass.

Continuation of Ser. No. 266,418, May 22, 1981, abandoned. This application Jul. 13, 1984, Ser. No. 630,991

Int. Cl.[4] G06F 9/16

U.S. Cl. 364—200 6 Claims



1. In a digital computer system including processor means for performing operations upon operands, memory means for storing instructions for directing said operations, bus means for conducting instructions between said memory means and said processor means, and I/O means for conducting operands between said processor means and devices external to said digital computer sytem, said processor means comprising:

ALU means connected to said bus means for performing said operations,

means connected to said bus means for receiving said in-

structions, each of said instructions being a member of a group of related instructions from a plurality of groups of related instructions,

microcode control means including means for storing sequences of microinstructions for controlling said operations performed by said ALU means,

said sequences of microinstructions including a plurality of sets of sequences of microinstructions, each set thereof corresponding to a group of related instructions from said plurality of groups of related instructions, and

each said set of sequences of microinstructions including at least one sequence of microinstructions which corresponds to one of the instructions of its corresponding group of related instructions,

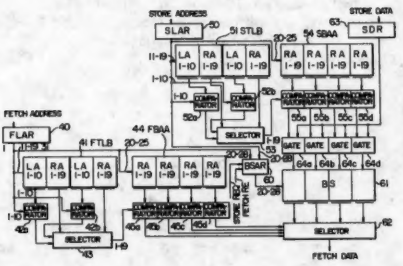
said instruction receiving means including group code register means for storing a plurality of group codes, each said group code corresponding to one of said group of related instructions and a current group code representing a group of related instructions of which a current instruction directing said operations is a member,

said microcode control means further including means responsive to each current instruction and to each corresponding current group code for providing at least one sequence of microinstructions to said ALU means.

4,618,926
BUFFER STORAGE CONTROL SYSTEM

Kanji Kubo, Hadano; Kenichi Wada, Zama, and Yooichi Shintani, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1983, Ser. No. 518,698
Claims priority, application Japan, Sep. 10, 1982, 57-156634
Int. Cl.⁴ G06Z *9/38, 9/34*
U.S. Cl. 364—200 **22 Claims**



1. A buffer storage control system, comprising:

first register means in which an address for a fetch request is set;

second register means in which an address for a store request is set;

third register means in which data for a store operation is set;

buffer storage means connected to said first, said second and said third register means for holding data;

first buffer directory means connected to receive the address from said first register means for outputting a signal indicating whether or not data designated by said address is held by said buffer storage means; and

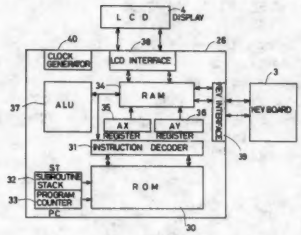
second buffer directory means connected to receive the address from said second register means for outputting a signal indicating whether or not data designated by said address is held by said buffer storage means;

wherein said buffer storage means includes means connected to said first buffer directory means and said second buffer directory means for fetching the data from said buffer storage means or for storing the data of said third register means in said buffer storage means in dependence on the outputs of said first and said second buffer directory means and the addresses of said first and second register means.

4,618,927
ELECTRONIC GAME APPARATUS

Koichi Hatta, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 24, 1983, Ser. No. 497,427
Claims priority, application Japan, May 24, 1982, 57-89380; Jun. 28, 1982, 57-112180
Int. Cl.⁴ G06F *15/44;* A63F *9/00*
U.S. Cl. 364—410 **9 Claims**



1. An electronic game apparatus performing a gaming function for use with a device having a diverse primary function comprising:

means for selecting between said primary function in a primary mode and said gaming function in a gaming mode;

display means for displaying a plurality of characters at a plurality of display positions, said display means further displaying one or more target symbols and corresponding game indicia when in said gaming mode;

key input means for introducing information into said device, said key input means further introducing game play information in said gaming mode, said key input means including at least one shift key, a shot key and a class selection key, said class selection key selecting game difficulty in said gaming mode;

target generation means, responsive to selection of said gaming mode, for simultaneously developing a plurality of sequentially varying target symbols at randomly selected ones of said plurality of display positions;

shift means, responsive to actuation of said at least one shift key for shifting a battery game indicia between said display positions;

shot means, responsive to actuation of said shot key, for determining the coincidence between said battery game indicia and any one of said target symbols and upon a coincidence thereof developing a score based on the variation of said one of said target symbols present upon actuation of said shot key;

score means, responsive to said score developed by said shot means, for accumulating a game score by adding each score developed thereby to a total score; and

difficulty varying means, responsive to actuation of said class selection key, for varying game difficulty by varying the speed at which said target symbols are sequentially varied by said target generation means;

said target generation means, shift means, shot means, score means and difficulty varying means being collectively comprised by a central processing means (CPU);

said CPU comprising a ROM, a RAM, and an arithmetic and logical unit;

wherein said RAM comprises;

data register means for storing symbol data representative of one or more said target symbols;

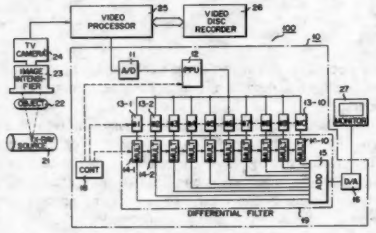
data-figure register means for storing position data representative of one or more of the display positions of said target symbols;

score register means for storing said total score;
point register means for storing said score;
game indicia-position register means for storing the display position of the battery game indicia;
timer counter for counting a period of shooting said one or more target symbols with the battery game indicia;
class register means for storing a difficulty class indicative of the selected game difficulty; and
count-up register means for incrementing the data representative of the variation in said target symbols.

4,618,928
DATA PROCESSING APPARATUS FOR PRODUCING X-RAY IMAGES WITH IMPROVED SIGNAL TO NOISE RATIO

Michitaka Honda, Ootawara, and Katsuya Kikuchi, Tochigi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 5, 1983, Ser. No. 558,100
Claims priority, application Japan, Dec. 6, 1982, 57-214294
Int. Cl.[4] H04N *5/32, 7/00*
U.S. Cl. 364—414 **4 Claims**



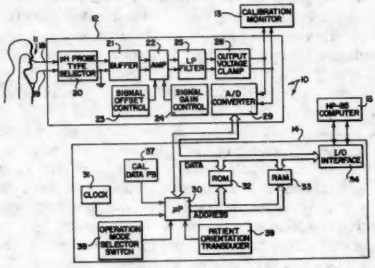
1. An apparatus for generating a processed video signal representative of an image of an object over a series of successive observation times, comprising:
a source of radiation directable at said object;
means for converting radiation passing through said object into an electric video signal having successive frames;
means for storing a series of said successive frames of said video signal;
means for multiplying, for each observation time, each of said successive stored frames by a differential filter coefficient, with the value of said coefficient for each frame being a function of the relationship between the time that frame occurred and said observation times; and
means for combining said multiplied frames, for each observation time, to produce said processed video signal.

4,618,929
PORTABLE CIRCUIT AND METHOD FOR PERFORMING A TIME STUDY AND ANALYSIS OF BODILY IONIC CHARACTERISTICS

Joseph M. Miller; Stephen W. Fannin, and Paul R. Steiner, Akron; Bruce C. Taylor, Kent, all of Ohio, assignors to Akron City Hospital, Akron, Ohio

Filed May 4, 1983, Ser. No. 491,455
Int. Cl.[4] G06G *7/60;* **A61B** *5/05, 5/00*
U.S. Cl. 364—415 **14 Claims**

1. A circuit for monitoring over a period of study time a bodily ionic characteristic comprising:
transducer means for measuring the ionic characteristic and generating an analog signal proportional thereto;
interface means for receiving said analog signal from said transducer means and converting said analog signal into a representative digital signal, said interface means including adjustment means for permitting correction for drift in calibration of said transducer means;
processor means for receiving said digital signal, sampling and storing said digital signal at preselected occasions over the period of study time, and upon the conclusion of the period of study time rapidly transmitting all said stored digital signals to a data analysis device, said processor means including means for determining the orientation

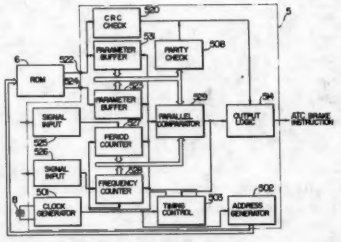


of the patient from which the bodily ionic characteristic is being monitored; and,
housing means for portably carrying said interface means and said processor means, said transducer means electrically connected to said interface means.

4,618,930
AUTOMATIC TRAIN CONTROL APPARATUS

Masahiro Ueno; Korefumi Tashiro, both of Hitachi, and Eiichi Toyota, Katsuta, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Continuation of Ser. No. 307,202, Sep. 30, 1981, abandoned. This application Oct. 16, 1984, Ser. No. 661,388
Claims priority, application Japan, Oct. 3, 1980, 55-137652
Int. Cl.[4] B61L *3/08*
U.S. Cl. 364—426 **14 Claims**



1. An automatic train control apparatus responsive to a frequency-modulated ATC signal, which is transmitted from a transmitter disposed along the train track and indicates one of a plurality of selected speed limits, for limiting the speed of the train as indicated by a speed signal received from a speed detector to a speed not higher than the speed limit indicated by the ATC signal, comprising:
memory means including a read-only memory for storing digital codes corresponding to respective ones of said plurality of selected speed limits; and
a large-scale integrated circuit connected to said read-only memory, and including:
(a) signal input means for receiving an ATC signal from said transmitter and said speed signal having a frequency corresponding to the train speed from said speed detector,
(b) speed limit detecting means connected to said signal input means and said read-only memory for identifying the speed limit indicated by said received ATC signal and

for reading out of said read-only memory a digital code corresponding to said identified speed limit,

(c) speed correlation means for comparing the speed limit indicated by the received ATC signal with the actual train speed indicated by said received speed signal, including first signal mode matching means connected to said signal input means and said speed limit detecting means for converting the mode of said speed signal or the mode of said digital code read out of said read-only memory to produce a speed signal and a speed limit signal whose signals modes correspond to each other, and comparison means connected to said signal mode matching means for producing an output when said speed signal exceeds said speed limit signal, and

(d) output means for delivering a false instruction signal in response to the output of said comparison means so as to prevent the train from exceeding the speed indicated by said ATC signal.

4,618,931

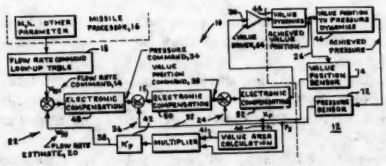
GAS GENERATOR FUEL FLOW THROTTLE CONTROL SYSTEM

William H. Miller, McGregor; Samuel E. McClendon, Waco, both of Tex.; Raymond J. Kolodziej, Canoga Park, Calif., and Donald L. Brand, Bend, Oreg., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 21, 1984, Ser. No. 591,715

Int. Cl.⁴ G06F *15/46*

U.S. Cl. 364—431.02 **1 Claim**



1. A throttle control system for controlling a gas flow from a gas generator to a solid propellant grain of an air-to-air missile, a plurality of input signals from a missile command processor and a plurality of feedback sensor signals from said gas generator controlling at least one output signal from said throttle control system, said throttle control system comprising:

a look-up table means, said look-up table means receiving said input signals from said missile command processor, said input signals addressing said look-up table means whereby said look-up table means outputs preselected data being a commanded fuel flow rate signal based upon said input signals;

means for signal conditioning, said feedback sensor signals being input said signal conditioning means, said signal conditioning means operating on said feedback sensor signals for digital signal processing, said signal conditioning means outputting conditioned feedback sensor signals;

a data acquistion means for multiplexing and converting said plurality of conditioned feedback sensor signals from analog to digital signals, said data acquisition means outputting a plurality digital signals;

a microprocessor, said microprocessor receiving said commanded fuel flow rate signal from said look-up table means and said digital signals from said data acquisition means, said microprocessor operating upon said digital signals in accordance with a program, said microprocessor outputting an actuator signal to control said gas generator;

means for memory, said memory means connected to said microprocessor by a data bus and an address bus, said memory means storing said program, said program minimizing a fuel flow error rate being the difference between a slope adjusted commanded fuel flow rate signal and a calculated fuel flow rate signal based upon said feedback sensor signals and said commanded fuel flow rate signal, said error rate determining an adaptive gain factor, said adaptive gain factor being defined as

$$GX_{pn}=(1.175)^n GX_{po}$$

said n being determined from an error history file stored in said memory means, said error history file having data therein to determine the next value of n whereby said n remains constant if said fuel flow error rate falls within an error band of a selected value, said n is reduced by a selected value if said fuel flow error rate changes polarity, said n changes by a selected value if a magnitude of a current fuel flow error rate is different by a preselected percentage than a previous fuel flow error rate;

an address decoder, said address decoder connected to said microprocessor and said memory means, said address decoder allowing said microprocessor and said memory means to read said digital signals from said data acquisition circuit and said commanded fuel flow rate from said look-up table;

a timer, said timer connected to said microprocesor, said timer outputting a pulse width modulated signal;

a voltage regulator, said voltage regulator converting input voltages to selected voltages and applying said selected voltages to said throttle control system;

a switching power amplifier, said amplifier being connected to said voltage regulator and providing a drive voltage, said power amplifier being connected to said microprocessor and said timer through said address decoder, said microprocessor outputting said actuator signal that determines a direction of movement of said actuator, said timer proportionally varying said drive voltage by pulse-width modulation; and

a valve driver, said valve driver being used to control direction and speed of a valve in a throttle of said gas generator, said valve driver connected to said switching power amplifier.

4,618,932

CONTROL DEVICE FOR AT LEAST TWO CIRCULATING SHELVING SYSTEMS

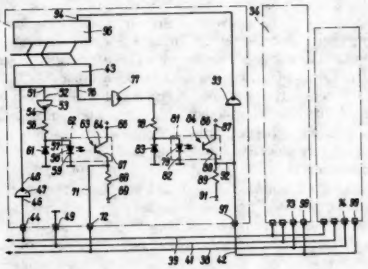
Hans-Peter Sauer, Bellheim, Fed. Rep. of Germany, assignor to Bellheimer Metallwerk GmbH, Bellheim, Fed. Rep. of Germany

Filed Mar. 27, 1984, Ser. No. 593,823

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312777

Int. Cl.⁴ G06F *15/46*

U.S. Cl. 364—478 **12 Claims**



1. Control arrangement for circulating shelving having at least first (11) and second (12) systems of circulating shelving, each of said systems of circulating shelving being controlled by

a data processing system and having a plurality of carriers for storing goods, said carriers being moved by a drive system, means for detecting the position of said carriers, means for detecting the occupancy of said carriers, and a data station having a data terminal and a data transmission device,

said data station (33) of said first system being connected via a receive line (39), a transmit line (38) and a return line (41) to the data station (34) of said second system and to a data station (36) of the data processing system (37), said receive line being connected to a signal input of the data terminal of said first system, said transmit line being connected to a signal output of the data transmission device of the first system, and said return line being connected to the ground of the data station of the first system, and

a first transistor driven by the signal output of the data transmission device of said first system, said first transistor being operated in an emitter circuit having a high resistance voltage path, said transmit line being connected to the emitter of said first transistor.

4,618,933

METHOD FOR DETECTING A FAULT OR ALSO THE DIRECTION OF A FAULT IN ELECTRIC LINES AND MEANS FOR EXECUTING THIS METHOD

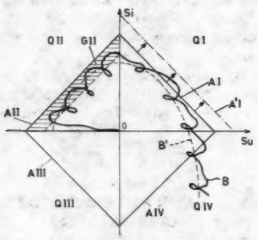
Michael Vitins, Zürich, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jun. 21, 1983, Ser. No. 506,410

Claims priority, application Switzerland, Jun. 23, 1982, 3836/82

Int. Cl.[4] G06F *15/20*; G01R *31/08*

U.S. Cl. 364—481 **12 Claims**



1. A method for detecting a fault and a fault direction in electric lines, comprising:

simultaneously measuring voltage and current at at least one location in said electric lines and forming voltage and current step signals (Su, Si) based on said measuring;

establishing a Cartesian coordinate system defining four quadrants and an origin, said coordinate system having one coordinate corresponding to said voltage step signal Su and another coordinate corresponding to said current step signal Si, wherein each pair of said simultaneously measured signals Su, Si forms a point in said coordinate system and said points define a line of motion progressing from one quadrant to a next adjacent quadrant;

establishing predetermined triggering boundaries in each of said quadrants and establishing predetermined boundary zones to a predetermined depth from each triggering boundary toward said origin;

monitoring progress of said line of motion relative to said triggering boundaries and said boundary zones;

displacing the triggering boundary in said next adjacent quadrant upon a detection in said monitoring step that said line of motion has entered the boundary zone of said one quadrant;

detecting a fault upon a detection in said monitoring step that said line of motion has transgressed a triggering boundary and detecting a fault direction based on the quadrants in which a fault detection is made; and

generating a triggering signal upon a detection in said monitoring step that said line of motion has transgressed a triggering boundary.

4,618,934

ULTRASONIC MICROSCOPE APPARATUS

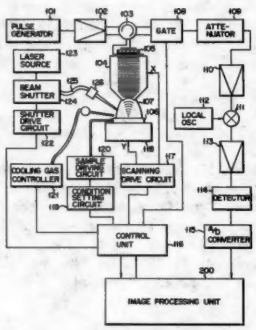
Masashi Nagase, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 27, 1983, Ser. No. 565,479

Claims priority, application Japan, Dec. 28, 1982, 57-233412

Int. Cl.[4] G06F *15/20*; G01N *29/04*

U.S. Cl. 364—507 **9 Claims**



1. An ultrasonic microscope apparatus comprising:

means for varying the operating conditions of an integrated circuit;

means for obtaining ultrasonic images of said integrated circuit by scanning said circuit with an ultrasonic beam;

memory means for individually storing said ultrasonic images;

means for calculating difference values for corresponding portions of said stored ultrasonic images produced for different operating conditions of said circuit; and

means for displaying said difference values to provide information regarding defects in said circuit.

4,618,935

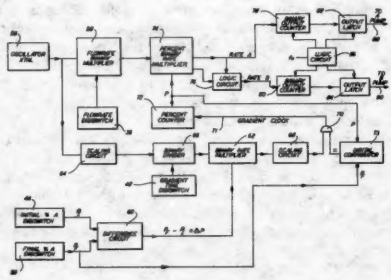
LIQUID CHROMATOGRAPHY CONTROLLER

Arnold Schwartz, Bridgeport, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 6, 1984, Ser. No. 568,765

Int. Cl.[4] G06G *7/57*; G01N *31/00*

U.S. Cl. 364—510 **11 Claims**



1. A controller for creating a linear gradient dual solvent flow pattern in a dual pump liquid chromatography system

wherein one pump pumps one solvent and the other pump pumps the second solvent, said controller comprising:

first clock means for producing a timing signal;

second means for inputting a preselected first digital signal representative of an initial value for one of the two solvents;

third means for inputting a preselected second digital signal representative of a final value for said one of two solvents;

fourth means responsive to said second and third means for outputting a third digital signal representative of the difference between said inititial and said final values;

fifth means manually setable for providing a fourth digital signal representative of a preselected time duration of said linear gradient;

sixth digital means for regulating said timing signal to produce a fifth digital signal proportional to said fourth digital signal;

seventh digital means, responsive to the fifth digital signal and the third digital signal, for producing a sixth digital signal representing digital counts proportional to the span of the gradient;

eighth means for accumulating digital counts from said sixth digital signal and outputting a seventh signal corresponding thereto;

said clock means producing a second timing frequency signal;

ninth means for providing an eighth digital signal representative of the total flow rate of both of said pumps;

tenth digital means, responsive to the second timing signal and the eighth digital signal for producing a ninth digital signal representative of the product of the timing frequency signal and the flow rate of both said pumps;

eleventh means for regulating said ninth digital signal responsive to said seventh signal and outputting pulse rates representing the percent rate of said first pump and the percent rate of said other pump;

twelfth means for counting said percent rates over a preselcted time interval to produce digital numbers representing the flow of the first pump and the flow of the other pump, said digital numbers being latched at the end of said preselect intervals; and

thirteenth means for inputting the digital numbers latched to said pumps to set the flow rates of the pumps, respectively.

4,618,936

SYNTHETIC SPEECH SPEED CONTROL IN AN ELECTRONIC CASH REGISTER

Fusahiro Shiono, Habikino, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 27, 1982, Ser. No. 452,941

Claims priority, application Japan, Dec. 28, 1981, 56-212705; Dec. 28, 1981, 56-212706

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 364—513.5 **13 Claims**

1. A synthetic speech generation control system comprising:

buffer memory means for temporarily storing speech data representative of audible speech;

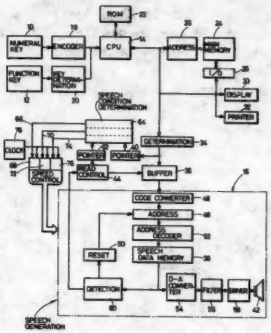
a synthetic speech generation circuit, receiving said speech data from said buffer memory means and converting said speech data into audible speech;

write control means, operatively connected to said buffer memory means, for introducing the speech data into said buffer memory means at a selected writing speed;

read control means for controlling the read out of said speech data stored in said buffer memory at a selected reading speed and the application of said speech data to said synthetic speech generation circuit;

determination means for monitoring the writing speed of said write control means and the reading speed of said read control means, and for developing a control signal when said writing speed is faster than said reading speed; and

control means, responsive to said control signal developed by said determination means, for increasing the reading



speed of said read control means when said control signal is developed from said determination circuit.

4,618,937

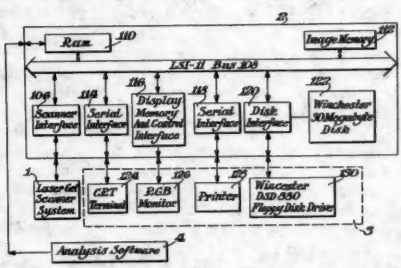
SPOT QUANTITATION

John G. Elias, Wilmington, and Peter A. Jansson, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Co., Inc., Wilmington, Del.

Filed Jan. 27, 1984, Ser. No. 574,713

Int. Cl.⁴ G06F *15/20;* **G06K** *9/00*

U.S. Cl. 364—518 **11 Claims**



1. A method of quantitating spatially-integrated intensities of individual spots contained in a multiple spot image defined by a discrete pixel-by-pixel representation of the intensity of the spots comprising the steps of:

(a) searching the image for the pixel representing the greatest intensity deviation in each of two opposite senses from a reference intensity level,

(b) constructing a mathematical three-dimensional model, in a sense corresponding to the sense of the maximum pixel found, of the spot containing such pixel, one of the dimensions being related to spot intensity,

(c) compensating the image by subtracting the mathematical model therefrom leaving possible overcompensated regions in the image which in turn can give rise to additional pixels that will subsequently be detected in step (a),

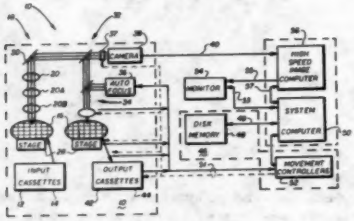
(f) quantitating the spot from the model by determining the volume of the model by multiplying the model's dimensions together, and

(g) repeating steps (a) through (d) for successive pixels each having a lower intensity deviation from the reference level until the image is of substantially constant intensity.

4,618,938
METHOD AND APPARATUS FOR AUTOMATIC WAFER INSPECTION

Paul Sandland, Gilroy; Curt H. Chadwick, Los Altos; Russell M. Singleton, Sunnyvale, and Howard Dwyer, Mountain View, all of Calif., assignors to KLA Instruments Corporation, Santa Clara, Calif.

Filed Feb. 22, 1984, Ser. No. 582,587
Int. Cl.[4] G06F 15/20
U.S. Cl. 364—552 25 Claims



1. Apparatus for automatically inspecting a patterned wafer, comprising:

a high-speed image computer for developing image data from input image signals;

a system control computer;

data storage means for storing image data corresponding to either pre-established image patterns or previously stored image patterns from an inspected wafer under control of said system computer, the stored image data being selectively used in accordance with a test program for test comparison with image data obtained from the wafer under inspection and processed by said high-speed image computer;

a wafer inspection subsystem including:

camera means for developing said input image signals corresponding to a wafer under inspection;

a macro inspection station for casting an image within a first range of magnification of the wafer under inspection onto said camera means;

a micro inspection station for casting an image of the wafer within a second range of magnification of the wafer onto said camera means;

a base for supporting both macro and micro inspection stations above a floor surface;

means for vibrationally isolating said wafer inspection subsystem from said base portion to minimize the effect of outside disturbances;

means for holding a plurality of cassettes, each said cassette being capable of storing a plurality of wafers;

an X-Y inspection stage for carrying a wafer under inspection from a position within said macro inspection station to a position within said micro inspection station;

a vacuum chuck on said X-Y stage for holding said wafer under inspection;

means for loading a wafer from one said cassette onto said vacuum chuck when it is in said macro inspection station;

means for automatically macro inspecting a wafer under different illumination conditions and powers of magnification to find if there are any serious macro defects;

means for automatically shifting the position of the vacuum chuck on the stage so as to align it and the carried wafer with the micro inspection station;

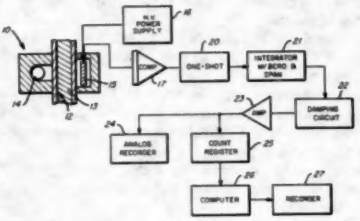
means for automatically performing micro inspection of the wafer to determine if it meets pre-established criteria for a good wafer; and

means for unloading the wafer from said chuck; and control means associated with said system computer and operative to control operation of said subsystem.

4,618,939
NUCLEAR DENSOMETER

James L. Davis, Marlow, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jul. 13, 1983, Ser. No. 513,528
Int. Cl.[4] G01T 1/16
U.S. Cl. 364—555 7 Claims



1. A method for use in a system utilizing a radioactive source and detector collimated to pass radiation through a flow of fluid for monitoring the density of such fluid, comprising the steps of:

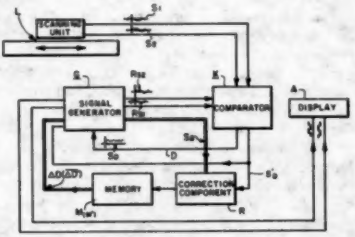
detecting radiation passed through a flow of fluid and developing electrical signals representative of the detected radiation,

processing said electrical signals with respect to a predetermined time and magnitude function parameter to provide an output response signal whenever said electrical signals simultaneously attain both the time and magnitude function parameter of said predetermined parameter whereby random electrical signals which do not attain said predetermined time and magnitude function parameter do not significantly affect an output response signal.

4,618,940
ERROR CORRECTION SYSTEM FOR DIGITAL LENGTH OR ANGLE MEASURING INSTRUMENT

Walter Schmitt, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jan. 20, 1983, Ser. No. 459,376
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1982, 3202339
Int. Cl.[4] G06F 15/36; G06G 7/18
U.S. Cl. 364—560 10 Claims



1. In a digital position measuring instrument of the type comprising means for generating a plurality of analog, periodic primary signals indicative of the relative position of a first object with respect to a second object, the plurality of primary

signals defining a set of primary signals, the improvement comprising:

signal generator means for generating a plurality of reference signals, the plurality of reference signals defining a set of reference signals, each reference signal associated with a respective one of the primary signals;

comparator means, responsive to the plurality of primary signals and the plurality of reference signals, for comparing the primary and the respective reference signals with respect to phase and amplitude;

correction means, coupled to the generator means and the comparator means, for determining correction data for symmetry, amplitude ratio, phase angle, and signal form of the reference signals; and

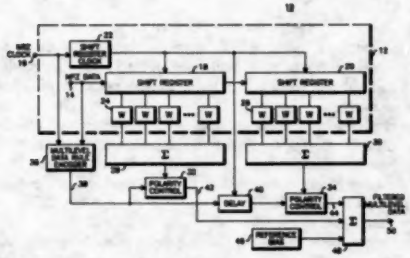
means, responsive to the correction means, for adapting one of (1) the set of reference signals and (2) the set of primary signals to correspond to the other of (1) the set of reference signals and (2) the set of primary signals in response to the correction data.

4,618,941

APPARATUS AND METHOD FOR GENERATING FILTERED MULTILEVEL DATA FROM NRZ DATA

Donald L. Linder, Palatine, and Scott N. Carney, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 19, 1983, Ser. No. 533,484
Int. Cl.[4] G06F *7/38;* **G06G** *7/02;* **H04L** *25/34, 25/49*
U.S. Cl. 364—724 **22 Claims**



1. An apparatus for generating filtered return to zero multilevel data from binary non-return to zero (NRZ) data comprising:

a binary finite impulse response (FIR) filter including a shift register means having a plurality of stages which receives the NRZ data, clock means for providing clock pulses to said shift register means for sampling each bit of NRZ data, a weighting element coupled to each stage for weighting each stage's output, and means for summing groups of said weighting elements to define summed signals, the number of weighting elements in each group not exceeding the number of clock pulses occurring during each bit of NRZ data;

means for selectively inverting the polarity of each of said summed signals, said inverting means comprising an operational amplifier for each of said summed signals, and means for selectively biasing each operational amplifier to function either as an inverting amplifier or a noninverting amplifier;

means responsive to each NRZ data bit for controlling the polarity selection of said inverting means in accordance with said return to zero multilevel data to be generated; and

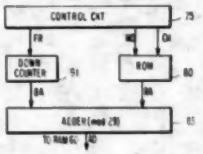
means for summing each of said polarity selected summed signals to define said filtered return to zero multilevel data.

4,618,942

ADDRESS INDICATION CIRCUIT CAPABLE OF RELATIVELY SHIFTING CHANNEL ADDRESSES RELATIVE TO MEMORY ADDRESSES

Yasuharu Tomimitsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 26, 1984, Ser. No. 604,273
Claims priority, application Japan, Apr. 26, 1983, 58-73267
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—900 **5 Claims**



1. An address indication circuit for use in combination with a random access memory included in a data processing system to indicate memory addresses of said random access memory for data sets arranged in a leading channel and other successive channels following said leading channel, said address indication circuit being for indicating each of said memory address with different delays predetermined for said channels, respectively, said different delays being equal to integral multiples of a prescribed time interval, said system comprising signal generating means for generating channel signals specifying the respective channels, wherein the improvement comprises:

channel address producing means responsive to said channel signals for producing, as a set of channel addresses, a reference number for said leading channel and integers for the respective successive channels, each of said integers being determined in relation to said reference number by successively accumulating said reference number and each of said integral multiples;

pointer means for pointing one of said addresses as a base address that is variable at every prescribed time interval; and

calculating means for calculating sums of said base address plus said channel addresses to provide the memory addresses.

4,618,943

SEMICONDUCTOR STATIC READ/WRITE MEMORY HAVING AN ADDITIONAL READ-ONLY CAPABILITY

Anthony G. Aipperspach; Joseph M. Fitzgerald, and Philip T. Wu, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 9, 1984, Ser. No. 569,080
Int. Cl.[4] G11C *11/40, 17/00*
U.S. Cl. 365—104 **10 Claims**

1. A combined read-only and read/write memory, comprising:

an array of storage cells, each said storage cell including an FET latch for storing read/write data and at least one transfer FET having source/drain and gate electrodes, the transfer FETs in different ones of storage cells being of first and second physically different types having different first and second threshold voltages for storing read-only data;

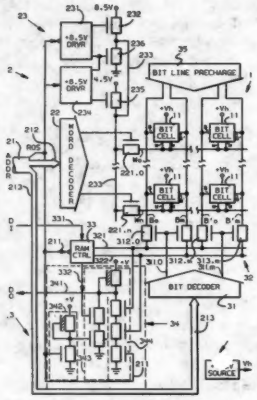
a mode-control line carrying a signal for selecting between a read/write and a read-only mode;

source means responsive to said mode-control line for selectively supplying a read/write voltage higher than both of said threshold voltages and a read-only voltage intermediate said threshold voltages;

word selector means including a plurality of individually

addressable word lines coupled to respective ones of said transfer-FET gates and to said source means;

bit selector means including a plurality of bit lines coupled to respective ones of said transfer FETs;



output means coupled to said bit lines and responsive to said mode-control line for selectively producing read-only and read/write output data from said bit selector means.

4,618,944

SEMICONDUCTOR MEMORY HAVING WORD LINE DISCHARGE CURRENT CONTROLLER

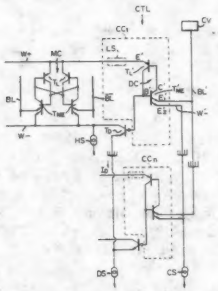
Yoshinori Okajima, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 28, 1984, Ser. No. 594,276

Claims priority, application Japan, Mar. 31, 1983, 58-053627

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189 **8 Claims**



1. A semiconductor memory comprising:

a plurality of word line pairs;

a plurality of bit line pairs intersecting said plurality of word line pairs;

a plurality of memory cells respectively connected at the intersections of said word line pairs and said bit line pairs, an inverse current flowing from said bit lines to said memory cells;

a word line discharge circuit, operatively connected to said word line pairs, for absorbing a discharge current from said word line pairs during a change from a selection state to a nonselection state of said word line pairs; and

control means, operatively connected to said word line discharge circuit, for controlling the discharge current so as to be gradually reduced together with a gradual attenuation of the inverse current flowing from one of said bit lines to one of said memory cells, the waveform of the discharge current approximating an exponential characteristic curve.

4,618,945

SEMICONDUCTOR MEMORY DEVICE

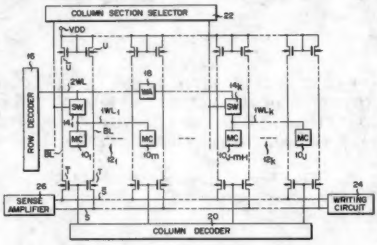
Takayasu Sakurai, Tokyo, and Tetsuya Iizuka, Funabashi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 26, 1983, Ser. No. 517,419

Claims priority, application Japan, Aug. 11, 1982, 57-138573; Nov. 19, 1982, 57-202948

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189 **18 Claims**



1. A semiconductor memory device comprising:

a plurality of memory cells arranged in a two-dimensional matrix array of rows and columns, said memory cells in each of said rows being divided into a plurality of column sections;

first word lines each connected to the memory cells in a different one of said column sections, said first word lines being organized into groups of word lines such that the memory cells connected to the first lines in each group of word lines are all in the same row of memory cells;

second word lines; and

switching means for connecting each of said second word lines to a different one of said group of first word lines.

4,618,946

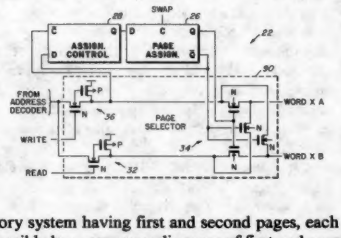
DUAL PAGE MEMORY SYSTEM HAVING STORAGE ELEMENTS WHICH ARE SELECTIVELY SWAPPED BETWEEN THE PAGES

Wendell Little, and Tim Williams, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 17, 1984, Ser. No. 651,028

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—189 **4 Claims**



1. A memory system having first and second pages, each of which is accessible by a corresponding one of first and second processors, the system comprising:

a plurality of storage locations, each of which provides

access thereto in response to the coupling of a selection signal thereto;

page assignment means for assigning a first set of the storage locations to the first page and a second set of the storage locations to the second page;

address decoding means for providing, in response to an address signal provided by a selected one of said first and second processors, a selection signal corresponding to a predetermined storage location in each of said first and second pages;

page selection means for coupling said selection signal to the corresponding storage location in the one of said first and second pages which is assigned to said selected one of said first and second processors;

access control means for providing said selected processor access to the storage location in said selected page corresponding to said selection signal; and

assignment control means for selectively swapping corresponding storage locations assigned to each of the first and second pages.

4,618,947

DYNAMIC MEMORY WITH IMPROVED ADDRESS COUNTER FOR SERIAL MODES

Bao G. Tran, Houston; Joseph H. Neal, Missouri City, and Lionel S. White, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 26, 1984, Ser. No. 634,901
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—230 **18 Claims**

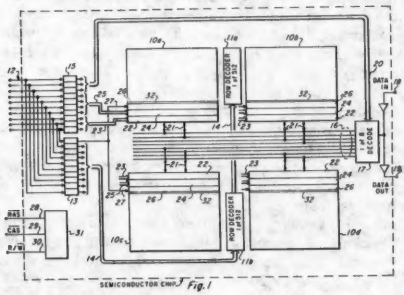


Fig. 1

1. A semiconductor memory device comprising:

an array of rows and columns of storage cells, row addressing means receiving a row address and activating one of said rows of cells in response thereto,

column addressing means receiving a column address and selecting from said activated row a plurality of columns of cells in response to the column address, to produce column output data,

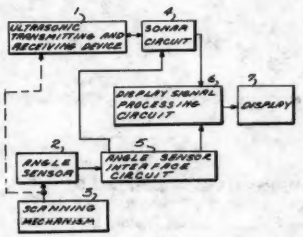
and an address counter included in said column addressing means, said address counter receiving selected bits of said column address in response to a control signal to provide a stored address, the address counter including means for incrementing said stored address in response to an address control input, and means responsive to said stored address for connecting said column output data to an output terminal.

4,618,948

APPARATUS FOR DETECTING OBSTRUCTIONS BEHIND VEHICLE

Hiroyuki Sakakibara, Hekinan; Shigeyuki Akita; Masao Kodera, both of Okazaki, and Tsuyoshi Maeno, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 15, 1983, Ser. No. 552,367
Claims priority, application Japan, Nov. 17, 1982, 57-201757
Int. Cl.[4] G01S *15/93*
U.S. Cl. 367—104 **10 Claims**



1. An apparatus for detecting obstructions behind a vehicle, the apparatus comprising:

an ultrasonic transmitting and receiving device disposed on the rear portion of the vehicle;

a scanning means for causing said transmitting and receiving device to scan the obstruction detecting region behind the vehicle;

an ultrasonic emitting and receiving means for emitting ultrasonic waves at given scanning positions via said ultrasonic transmitting and receiving device and for receiving the waves reflected from obstructions via said ultrasonic transmitting and receiving device;

a distance measuring means for measuring the time taken from the transmission to the reception of the ultrasonic waves to determine the distances to the obstructions;

scanning position detecting means for detecting the positions at which said transmitting and receiving device scans; and

a display means for displaying the distances to the obstructions at said given scanning position;

the ultrasonic transmitting and receiving device of said apparatus including: a shaft rotatably and vertically mounted to the rear portion of the vehicle; at least one ultrasonic vibrator rotatable together with said shaft; and a reflecting plate formed opposite to the vibrator and around the shaft whereby the ultrasonic waves produced by said ultrasonic vibrator are reflected by said reflecting plate and then directed radially outwardly, and wherein said reflecting plate also reflects the waves which are reflected back by obstructions to said ultrasonic vibrator for reception.

4,618,949

SELF-ORIENTING DIRECTIONALLY SENSITIVE GEOPHONE

Clive R. B. Lister, P.O. Box 45101 University Station, Seattle, Wash. 98145

Filed Mar. 19, 1984, Ser. No. 590,734
Int. Cl.[4] H04R *1/44*; G01V *1/16*
U.S. Cl. 367—171 **14 Claims**

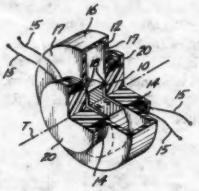
1. A geophone comprising, in combination:

magnetic field means with a polar axis aligned horizontally;

sealed chamber means containing a ferromagnetic fluid and magnetic field means, the ferromagnetic fluid interacting with the magnetic fluid means to movably suspend said magnetic field means within the ferromagnetic fluid;

coil means associated with said sealed chamber means, the axis of the coil means aligned with the axis of the magnetic field means whereby relative vertical movements of the

sealed chamber means and the magnetic means electromagnetically induce a current within the coil means;



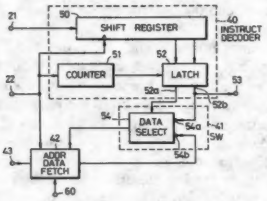
connection means for electrically connecting said coil to a conductor means.

4,618,950

ADDRESS DATA ACCESSING DEVICE IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Ryozo Abè, and Masaki Sakurai, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 16, 1984, Ser. No. 570,908
Claims priority, application Japan, Jan. 17, 1983, 58-4524[U]
Int. Cl.⁴ G11B *21/02*
U.S. Cl. 369—32 **6 Claims**



1. An address data accessing device in a reproducing apparatus which reproduces recorded signals from a rotary recording medium, said rotary recording medium being time-sequentially recorded with a plurality of channels of information signals, a time address signal and a chapter address signal, said reproducing apparatus having a predetermined mode in which only reproduced information signals in selected channels out of the plurality of channels are produced, each of the information signals in the respective channels being recorded in terms of different programs, said time address signal indicating a time required in a normal reproducing mode to reach a signal recorded position on said rotary recording medium from a starting position where recording of the programs is started at the time of the recording, said chapter address signal indicating each of the different programs, said address data accessing device comprising:

an output switching circuit for selectively outputting only the reproduced information signals in the selected channels out of the plurality of channels in the predetermined mode;

an address data fetch circuit for fetching as an address signal one of the time address signal and the chapter address signal which are reproduced from said rotary recording medium;

an instruction decoder for controlling said output switching circuit and said address data fetch circuit in response to an instruction signal which is supplied to said instruction decoder, said instruction signal comprising two bits for representing four instruction codes, two of said four instruction codes being used for selecting certain channels out of the plurality of channels, the remaining two instruction codes being used for determining which one of the time address signal and the chapter address signal is to be fetched; and

a switch circuit for switching output signals of said instruction decoder in response to a switching signal from said address data fetch circuit and for supplying one output signal thereof to said address data fetch circuit,

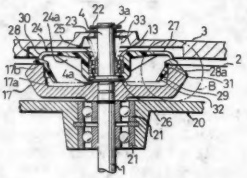
said address data fetch circuit alternately fetching and producing said time address signal and said chapter address signal to transmit the address signals under control of the one output signal of said switch circuit so that either one of said time address signal and said chapter address signal is obtainable in said predetermined mode.

4,618,951

DISC CLAMP DEVICE

Masao Okita, and Satoshi Sakai, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Apr. 17, 1985, Ser. No. 724,196
Claims priority, application Japan, Apr. 19, 1984, 59-56699[U]
Int. Cl.⁴ G11B *3/62*
U.S. Cl. 369—270 **5 Claims**



1. In a disc clamp device of the type comprising a turntable having an axial center of rotation for supporting a disc medium to be clamped thereon and driven in a horizontal plane of rotation, said turntable having an annular vertical wall forming a concave portion concentric with its axial center and having a diameter substantially equal to a diameter of a center hole formed in the disc, and a frame provided elevatably above said turntable and movable downwardly to a clamping position in opposition thereto, a shaft mounted on said frame and aligned with said axial center of said turntable when said frame is moved to said clamping position, and a clamp member mounted on said shaft so as to be positioned in said concave portion of said turntable and to clamp the disc to said turntable in said clamping position,

the improvement wherein said clamp member is formed as an integral member and includes a central hub mounted on said shaft, an arm connected to said central hub at one end thereof and extending downwardly and connected to a pressing face at the other end thereof, said pressing face of said clamp member having a horizontal clamping surface opposed to said turntable for clamping the disc thereon and a vertical engagement surface connected radially inwardly to said clamping surface for engagement with said vertical wall of said turntable, and a guide portion connected to said engagement surface of said pressing face and extending in a downwardly inclined direction toward said axial center and terminating in a free end located at a radial position inwardly of said radius of said concave portion,

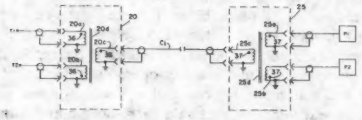
whereby as said frame is moved to said clamping position, said guide portion enters the center hole of the disc and said concave portion of said turntable so as to center the disc on said turntable and guides said engagement surface into engagement with said vertical wall of said concave portion of said turntable, and then said clamping surface of said pressing face is pressed downwardly on the disc to clamp it to said turntable.

4,618,952

COMMUNICATION OF UNIPOLAR PULSES

Meir Bochor, Herzlia, and Mordechai Gura, Haifa, both of Israel, assignors to Fibronics Ltd., Haifa, Israel

Filed Nov. 14, 1983, Ser. No. 551,882
Claims priority, application Israel, Nov. 4, 1983, 70134
Int. Cl.[4] H04J 7/02
U.S. Cl. 370—78 11 Claims



10. A connector unit for use in a unipolar pulse communication system, comprising:

first, second and third end terminals, each of said end terminals including means for connection to a coaxial cable; and

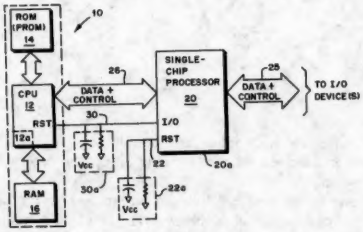
circuit means for providing a pulse at said third end terminal whenever a pulse is received at said first end terminal and for providing a pulse at said first end terminal whenever a pulse is received at said third end terminal, the pulse being provided at said third end terminal being of the same polarity as the pulses being received at said first end terminal and the pulse being provided at said first end terminal being of the same polarity as the pulse being received at said third end terminal, and for providing a pulse at said third end terminal whenever a pulse is received at said second end terminal and for providing a pulse at said second end terminal whenever a pulse is received at said third end terminal, the pulse being provided at said third end terminal being of the opposite polarity as the pulse being received at said second end terminal and the pulse being provided at said second end terminal being of the opposite polarity as the pulse being received at said third end terminal.

4,618,953

WATCHDOG CIRCUIT

Edward P. Daniels, Bridgeport, and Risto A. Rinne, Jr., New Milford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed May 1, 1984, Ser. No. 605,733
Int. Cl.[4] G06F 11/00
U.S. Cl. 371—12 17 Claims



1. A data processing system comprising:

(a) a main, multi-chip processor;

(b) a single-chip processor operatively associated with said main processor, said main processor transmitting and said single-chip processor receiving status information;

(c) reset means, controlled by said single-chip processor, for resetting said main processor; and,

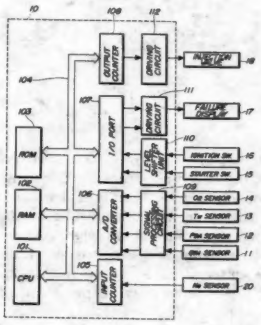
(d) timing means operatively associated with said single-chip processor for measuring the time elapsed between said status receptions by said single-chip processor and for signaling said single-chip processor, said single-chip processor through said reset means resetting said main processor in response to said signal if a predetermined amount of time elapses after one of said status receptions and before the next of said receptions.

4,618,954

METHOD OF DETECTING ABNORMALITY IN INPUT AND OUTPUT UNITS

Yutaka Otobe, Shiki, and Takeo Kiuchi, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1984, Ser. No. 615,056
Claims priority, application Japan, Jun. 21, 1983, 58-111665
Int. Cl.[4] G06F 11/00
U.S. Cl. 371—16 7 Claims



1. A method of detecting abnormalities through fault diagnosis applied to one input unit or one output unit by an electronic control unit to which said input unit or output unit is connected, said method comprising the steps of:

(a) subjecting said input unit or output unit to fault diagnosis wherein it is determined whether or not a signal indicative of operating conditions of said one input or output unit indicates a value which can be assumed when said one unit is in normal operating conditions;

(b) storing information, which is indicative of abnormality, in a first storage area of a memory in a first storage area of a memory in said electronic control unit when the abnormality detected by the diagnosis continues over a predetermined period of time (t_{FS1}, t_{FS2});

(c) subjecting said one input unit or output unit in which said abnormality has been detected, to the step (a);

(d) storing information, which is indicative of abnormality, in a second storage area of a memory in said electronic control unit when the abnormality detected by the diagnosis continues over said predetermined period of time (t_{FS1}, t_{FS2});

(e) determining whether or not contents stored in said first and second storage areas are identical;

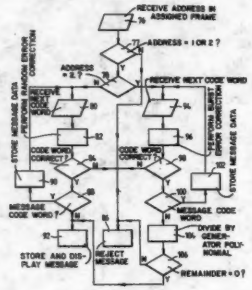
(f) rendering a decision to the effect that an abnormality has occurred in said one input unit or output unit when the contents stored in said first and second storage areas are determined to be identical; and

(g) the contents stored in said first and second storage areas are cleared when it is determined in said step (e) that the contents are not identical, thereby ensuring the detection of the occurrence of an abnormality in said one input or output unit, without being influenced by external noise or the like.

4,618,955
DIGITAL DATA TRANSMISSION SYSTEM

Anthony K. Sharpe, Teversham, and Peter J. Mabey, Crawley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 21, 1984, Ser. No. 581,753
Claims priority, application United Kingdom, Feb. 25, 1983, 8305296
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37 18 Claims

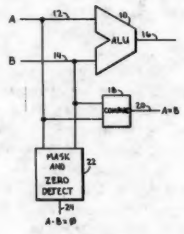


1. A digital data transmission system comprising a base station having encoding means for encoding message data in accordance with a code word format which includes information bits and cyclic redundancy check bits, and means for transmitting said encoded message, and a receiver having means for receiving said encoded and transmitted message, means responsive to said cyclic redundancy check bits to determine the presence of errors in a received code word, and means for applying error correction on a code word by code word basis, wherein said base station further comprises means for deriving a predetermined number of error detecting check bits by assembling a complete string of said information bits, dividing said string by an n-bit generator polynomial, n being an interger, and forming the (n−1) bit remainder of this division, and means for substituting said error detecting check bits for an equal number of the information bits of said transmitted message and said receiver further comprises means to detect false correction of erroneous data received.

4,618,956
METHOD OF OPERATING ENHANCED ALU TEST HARDWARE

Robert W. Horst, Cupertino, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed Sep. 29, 1983, Ser. No. 537,041
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—68 1 Claim



1. A method of operating a loop counter routine in a central processing unit of a digital computer, including the steps of:

(a) providing a data input, representative of a first desired quantity, to a first input of an arithmetic logic unit,

(b) providing a data input representing a second desired quantity to a second input of said arithmetic logic unit,

(c) performing a subtract operation using said arithmetic logic unit during a first clock period,

(d) performing an equivalence test on said first and second arithmetic logic unit inputs external to said arithmetic logic unit during said first clock period,

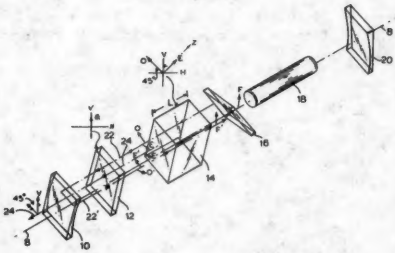
(e) terminating said loop counter routine if the result of said equivalence test indicates that first and second arithmetic logic unit inputs are equal and returning the results of said arithmetic logic unit subtract operation to said first input of said arithmetic logic unit if the result of said equivalence test indicates that said first and second arithmetic logic unit inputs are not equal,

(f) Repeating steps (b) through (e) until the result of said equivalence test indicates that said first and second arithmetic logic unit inputs are equal.

4,618,957
FREQUENCY DOUBLING A LASER BEAM BY USING INTRACAVITY TYPE II PHASE MATCHING

Kuo-Ching Liu, Setauket, N.Y., assignor to Quantronix Corporation, Smithtown, N.Y.

Filed Apr. 17, 1985, Ser. No. 724,089
Int. Cl.[4] H01S *3/10*
U.S. Cl. 372—22 12 Claims



1. A frequency-doubled laser comprising:

first and second mirrors forming an optical cavity therebetween;

a laser active medium disposed within said cavity for generating a fundamental beam at a preselected fundamental frequency and having a linear polarization which can be resolved into two orthogonal components;

a crystal for generating via Type II phase-matching a linearly polarized second harmonic beam in response to said fundamental beam, said crystal having an ordinary and an extraordinary axis, said orthogonal components of said fundamental beam being oriented along said axes, said crystal further generating a differential phase delay between said orthogonal components; and

means for eliminating on the return trip through said crystal said differential delay to produce a frequency doubled output beam.

4,618,958

DEVICE FOR CONTROLLING THE RADIATING OUTPUT OF A SEMICONDUCTOR LASER

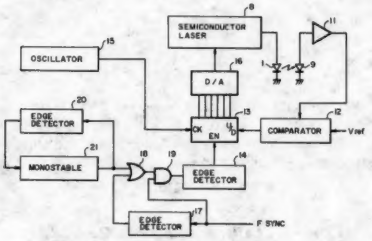
Isamu Shibata, and Yoshiaki Kanmoto, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Feb. 8, 1985, Ser. No. 699,590

Claims priority, application Japan, Feb. 10, 1984, 59-24090; Feb. 14, 1984, 59-25704; Feb. 16, 1984, 59-27739

Int. Cl.⁴ H01S *3/13*

U.S. Cl. 372—29 **3 Claims**



1. A device for controlling the radiating output of a semiconductor laser, comprising:

(a) a photodetector for detecting the radiating output of the semiconductor laser;

(b) a comparator for comparing an output signal from said photodetector with a reference signal;

(c) an up/down counter for counting clock signals in a count mode controlled by an output signal from said comparator;

(d) a digital-to-analog converter for converting a count output from said up/down counter into an analog signal;

(e) a semiconductor laser driver for supplying said semiconductor laser with a current proportional to the analog signal from said digital-to-analog converter; and

(f) means for controlling and holding the current supplied to said semiconductor laser to equalize the input signals applied to said comparator.

4,618,959

DOUBLE HETEROSTRUCTURE SEMICONDUCTOR LASER WITH PERIODIC STRUCTURE FORMED IN GUIDE LAYER

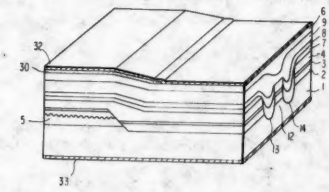
Ikuo Mito, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 12, 1983, Ser. No. 541,211

Claims priority, application Japan, Oct. 12, 1982, 57-178824; Mar. 16, 1983, 58-43477; Apr. 5, 1983, 58-59505

Int. Cl.⁴ H01S *3/19*

U.S. Cl. 372—46 **4 Claims**



1. A double heterostructure semiconductor laser device comprising:

a composite structure including a semiconductor substrate of one conductivity type and a first semiconductor layer disposed on said semiconductor substrate, said composite structure having a first level and a second level, said second level being higher than said first level by a distance equal to or greater than the thickness of said first semiconductor layer, the transition between said first and second levels being in the propagation direction of the laser radiation and having a slant crystal face, and said first semiconductor layer on said second level, having a periodic structure of a prescribed pitch and thickness formed in the propagation direction of the laser radiation, for providing an optical reflector;

a second semiconductor layer of said one conductivity type, formed on said first and second levels, having a greater bandgap than that of said first semiconductor layer, said second semiconductor layer comprising two portions the first portion overlying said first level, the second portion overlying said second level;

a semiconductor active layer, formed on said second semiconductor layer, having a smaller bandgap than that of said second semiconductor layer, the ends of said semiconductor active layer and first semiconductor layer abutting together in the extension of said slant crystal face;

a third semiconductor layer of the opposite conductivity type to that of said substrate, formed on said semiconductor active layer and said slant crystal face, and having a greater bandgap than that of said semiconductor active layer; and

a pair of electrodes in contact with said laser device for injecting a current into said semiconductor active layer to produce stimulated emission of radiation.

4,618,960

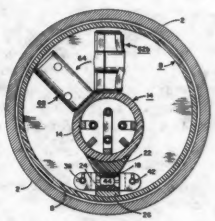
GAS LASER WITH ACOUSTIC BAFFLE

Said Nazemi, Belmont, Mass., assignor to Laser Science, Inc., Cambridge, Mass.

Filed Jan. 23, 1984, Ser. No. 573,003

Int. Cl.⁴ H01S *3/22*

U.S. Cl. 372—58 **7 Claims**



1. In a gas laser having a resonant cavity, an active gas medium, and energy extracting means, the combination comprising

a generally cylindrical baffle formed of insulating material positioned within and spaced from an outer shell of said cavity,

a generally cylindrical support formed of insulating material positioned within said baffle,

means for circulating said gas medium around an annular path between said baffle and said support,

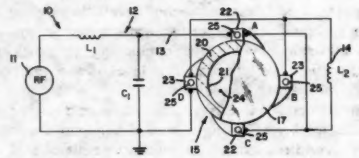
a cathode and an anode mounted in spaced opposing relationship in said annular path, and

power supply means having a conductive circuit applying a high voltage to said anode and cathode and thereby produce a transverse electrical discharge therebetween.

4,618,961
CONFIGURATION OF ELECTRODES FOR TRANSVERSELY EXCITED GAS LASERS

Leroy V. Sutter, Jr., 6301 Summertime La., Culver City, Calif. 90230

Filed Dec. 16, 1982, Ser. No. 450,195
The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.
Int. Cl.[4] H01G 3/097
U.S. Cl. 372—87 11 Claims



1. A configuration of electrode means for use in a transversely excited gas laser which includes:

a. an elongated cylindrical chamber of cross-sectional dimensions suitable for confining a laser gas discharge;

b. a laser gas disposed in said chamber;

c. first and second reflecting means for reflecting light energy from said laser gas discharge within said chamber so that said light energy travels longitudinally the length of said chamber;

d. energy means for applying a voltage of alternating polarity between said electrode means at a frequency ranging from 10 Mhz to about 3 GHz to establish said laser gas discharge in said laser gas; and

e. coupling means for matching the steady state reactive impedance of said chamber to the impedance of said energy means and for coupling said energy means to said electrode means, said configuration of electrode means comprising:

a. a first electrode plate and a second electrode plate each of which is formed from an electrically conductive material and is disposed opposite to the other on the outer surface of said chamber in a first plane; and

b. a third electrode plate and a fourth electrode plate, each of which is formed from an electrically conductive material and is disposed opposite to the other on the outer surface of said chamber in a second plane which is orthogonal to said first plane whereby the phase correlation of said improved configuration of electrode means is such that said first electrode plate is in phase with said second electrode plate, said third electrode plate is in phase with said fourth electrode plate and said first electrode plate has an opposite polarity than said third electrode plate.

4,618,962
FURNACE BOTTOM HEATING

Ronald W. Palmquist, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 2, 1985, Ser. No. 729,619
Int. Cl.[4] C03B 5/027
U.S. Cl. 373—30 21 Claims

1. A melting furnace comprising:

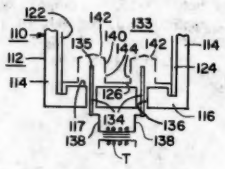
a refractory vessel, a molten bath retained therein,

a metal liner having sidewall portions and a bottom plate positioned within said refractory vessel and spaced-apart from inner surface portions thereof,

electrically energizable heating means for supplying heat to a lower portion of said melting furnace positioned within a space between said bottom plate and a bottom wall of said refractory vessel,

molten bath-like material within said space between said bottom plate and said bottom wall,

said heating means being spaced-apart from the bottom wall of said refractory vessel,



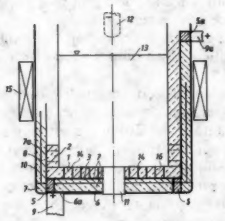
and said bottom plate having raised portions

which receive said heating means positioned within the space formed between said bottom plate and the bottom wall of said refractory vessel.

4,618,963
DIRECT CURRENT ARC FURNACE

Bo Rappinger, and Sven-Einar Stenkvist, both of Västerås, Sweden, assignors to Asea AB, Västerås, Sweden

Filed Jan. 22, 1985, Ser. No. 693,165
Claims priority, application Sweden, Jan. 25, 1984, 8400367
Int. Cl.[4] H05B 7/00
U.S. Cl. 373—72 2 Claims



1. A DC arc furnace having an electrically conductive hearth adapted to contain a melt, at least one arcing electrode above the hearth and adapted to form a heating arc with the melt when the hearth and electrode are supplied with DC power; the hearth having a wear lining directly contacted by the melt and formed by refractory material through which electrical conductors extend from the bottom of the wear lining to its top, a metal plate under the wear lining and substantially coextensive therewith and connected to the electrical conductors, a layer of refractory on which the bottom of said plate rests, said layer having a periphery formed by electrically conductive refractory in electrical contact with the plate's periphery and radially inwardly thereof being formed by electrically non-conductive refractory providing thermal insulation under the plate, and means for connecting said electrically conductive refractory with electric power.

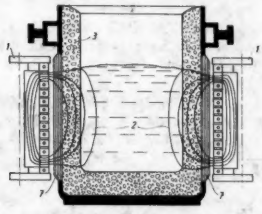
4,618,964
LADLE OR TUNDISH

Hans G. Larsson; Erik Westman, both of Västerås, and Artur Ostlund, Linkoping, all of Sweden, assignors to Asea AB, Västerås, Sweden

Filed Feb. 5, 1985, Ser. No. 698,447
Claims priority, application Sweden, Feb. 6, 1984, 8400586
Int. Cl.[4] H05B 5/16
U.S. Cl. 373—155 7 Claims

1. A ladle or tundish for inductively heating molten metal in the ladle or tundish, and having a side wall formed by an inner wall of heat-insulated ladle lining compound contacted by the

molten metal, and an outer concrete wall made of concrete reinforced by metal wires embeded in the concrete, the wires



being electrically insulated from each other, the outer concrete wall supporting the inner wall made of the ladle lining compound.

4,618,965

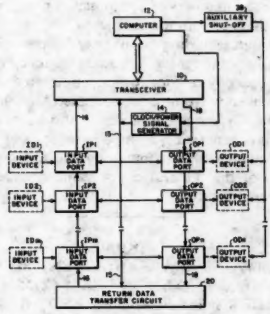
MONITORING OF DATA TRANSFER SYSTEM HAVING SERIALLY DISTRIBUTED DATA PORTS

Duane S. Maxwell, Coronado; Roger Phillips, Cardiff By The Sea, and Eduard A. Schwan, Oceanside, all of Calif., assignors to Teleplex Corporation, San Diego, Calif.

Filed Mar. 18, 1985, Ser. No. 713,295

Int. Cl.[4] H04B *3/46*

U.S. Cl. 375—10 **23 Claims**



1. A method of monitoring a data transfer system having input data ports connected in series to a receiver by an input data line for frame-by-frame serial shifting of input data from the respective input data ports over the input data line to the receiver and output data ports connected in series to a transmitter by an output data line for frame-by-frame serial shifting of output data to the respective output data ports over the output data line from the transmitter, wherein each frame of input data is transferred through the respective input data ports onto the input data line for input devices respectively connected to individual input data ports; and wherein each frame of serially-shifted output data is transferred through the respective output data ports from the output data line to output devices respectively connected to individual output data ports, the method comprising the steps of

(a) serially shifting successive data frames bit-by-bit to the output data ports over the output data line from the transmitter, wherein each frame contains a single unique data bit in a data bit position that changes progressively from one frame to the next in relation to the position of the respective output data ports;

(b) upon the conclusion of each frame shift, transferring data from a predetermined data bit position on the output data line past the most remote output data port with respect to the transmitter to a position on the input data line that is a given number of bit positions past the most remote input data port with respect to the receiver;

(c) shifting successive data frames over the input data line to the receiver synchronously with the shifting of data frames over the output data line;

(d) examining each data frame shifted to the receiver to detect a frame containing a said unique data bit; and

(e) counting the number of data frames shifted from the transmitter prior to detecting the frame containing the unique data bit to provide an indication of the number of output data ports.

4,618,966

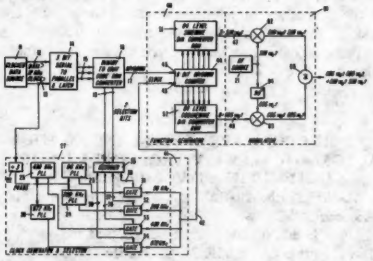
FREQUENCY SHIFT KEY MODULATOR

Elvin D. Stepp, Fairfield, and Gary L. Claypoole, West Chester, both of Ohio, assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Jun. 1, 1983, Ser. No. 500,090

Int. Cl.[4] H04L *27/12*; H03C *3/02*

U.S. Cl. 375—62 **15 Claims**



15. Apparatus for frequency modulating a carrier wave in response to a digital data input signal comprising means responsive to the data signal for deriving variable frequency orthogonal sinusoidal like stepped waves, the variable frequency being controlled so that it is changed in discrete steps with phase coherence in response to successive values of the data signal having different values, the variable frequency deriving means including: means for deriving a plurality of different frequencies synchronized to the input signal, an up/-down counter, and means responsive to the value of the input signal for controlling the counting direction of said counter and for controlling which one of said frequencies is applied to a clock input of said counter, said counter deriving a multi-bit output representing the phase angle indication, and means responsive to the phase angle indication for sinusoidally changing the frequency and phase of the carrier by amounts respectively determined by the rate of change of the represented phase angle value and the phase angle value, and means for vectorially combining the orthogonal stepped waves and the carrier wave to derive a constant amplitude AC wave having the carrier frequency and frequency modulated at the variable frequency.

4,618,967

RADIO RECEIVER

Ian A. W. Vance, Newport, and Michael W. Neale, Harlow, both of England, assignors to Standard Telephones and Cables, plc, London, England

Filed Jun. 26, 1984, Ser. No. 624,749

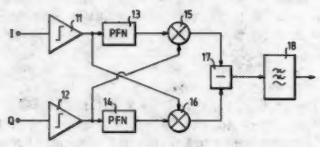
Claims priority, application United Kingdom, Jul. 14, 1983, 8319101

Int. Cl.[4] H04B *1/16*; H04L *27/14*

U.S. Cl. 375—80 **6 Claims**

1. A radio receiver for receiving frequency modulated signals on an R.F. carrier signal, wherein the received signals are mixed with a local oscillator signal at the carrier signal frequency to produce quadrature baseband signals in two separate

signal channels, the receiver including a demodulator arrangement for the baseband signals, the demodulator arrangement including means for limiting the baseband signals in each signal channel to form square wave signals in quadrature, means in each channel to derive from the square wave signals in that channel a sequence of pulses the frequency of which is representative of the polarity changes in the square wave signal, means for multiplying the pulse sequence in each channel by



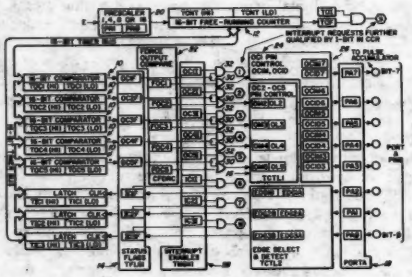
the square wave signal in the other channel to produce two unipolar pulse trains, the pulse frequency in each unipolar pulse train being equal to that of the pulse sequence from which it is derived, and means for generating an output pulse signal the frequency of which is equal to the sum of the frequencies of the two unipolar pulse trains such that when the output pulse signal is low pass filtered it simulates information modulated on the R.F. signal.

4,618,968

OUTPUT COMPARE SYSTEM AND METHOD AUTOMATICALLY CONTROLLING MULTIPLE OUTPUTS IN A DATA PROCESSOR

James M. Sibigtroth, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 4, 1983, Ser. No. 549,363
Int. Cl.[4] H03K *21/00*; G06F *7/02*
U.S. Cl. 377—39 **4 Claims**



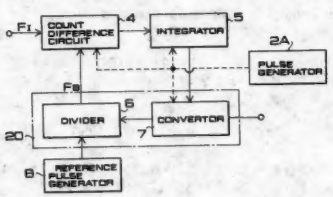
1. In a timer system comprising:
a first counter for counting pulses of a first input signal;
a first compare register for selectively storing a first compare value therein; and
a first comparator, coupled to the output of the first counter and to output of the first compare register, for comparing the first counter value to the first compare value, and for providing a first compare signal when said values are the same;
the improvement comprising:
a data register for selectively storing first and second data bits therein;
a mask register for selectively storing first and second mask bits therein; and
logic means, connected to said first comparator to receive the first compare signal, for providing a first output signal indicative of the state of the first data bit in response to said first compare signal only if the first mask bit is a predetermined state, and to provide a second output signal indicative of the state of the second data bit in response to said first compare signal only if the second mask bit is a predetermined state.

4,618,969

DIGITAL RATEMETER

Shinji Badono, and Yoshikazu Tsutaka, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1985, Ser. No. 716,098
Claims priority, application Japan, Mar. 27, 1984, 59-57264
Int. Cl.[4] H03K *25/00*
U.S. Cl. 377—49 **6 Claims**



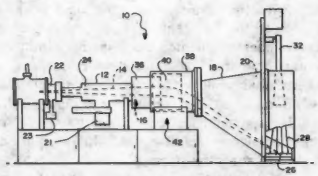
1. A digital count ratemeter comprising:
a count difference circuit for adding input pulse signals, subtracting frequency of divider pulse and accumulating pulse count values every unit time;
an integrator for receiving and integrating the positive and negative the numbers of accumulated pulse counts of said count difference circuit; and
a feedback unit including a converter for converting integral count value of the integrator into frequency division ratio and a frequency divider for submultiplying the reference pulse frequency from reference pulse generator in dependence on the frequency division ratio output of the converter and generating a divider pulse, and adapted for transforming a divider pulse by the use of exponential function of the integral count value and delivering the transformed result.

4,618,970

BEAM POSITIONING ARRANGEMENT FOR USE IN A SCANNING ELECTRON BEAM COMPUTED TOMOGRAPHY SCANNER AND METHOD

Roy E. Rand, Palo Alto; John W. J. Mitchell, Redwood City, and John L. Couch, San Francisco, all of Calif., assignors to Imatron, Inc., San Francisco, Calif.

Filed Apr. 5, 1984, Ser. No. 597,134
Int. Cl.[4] A61B *6/08*; H01J *35/14*
U.S. Cl. 378—10 **6 Claims**



1. In a scanning electron beam computed tomography scanner including means defining a vacuum chamber, means for producing an electron beam at a first location in the chamber and for directing said beam to a second location therein along a particular desired path, an arrangement for detecting deviations between the actual path taken by said beam between said first and second locations and the desired path, said arrangement comprising a network of electrically conductive wires

which are electrically insulated from one another and which are located across said desired path between said first and second locations such that the impingement of one or more of said wires by said electron beam produces an electrical signal dependent upon the actual path taken by said beam between said locations, whereby said signal can be compared to a reference signal corresponding to one which is produced by said network of wires as a result of the impingement of said beam when the latter extends along said desired path, said scanner including means for comparing said first mentioned signal with said reference signal.

4,618,971

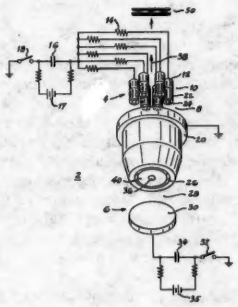
X-RAY LITHOGRAPHY SYSTEM

Arnold Weiss, Minneapolis, Minn.; Herman P. Schutten; Louis Cartz, both of Milwaukee, Wis.; Gordon B. Spellman, Mequon, Wis.; Stanley V. Jaskolski, Sussex, Wis., and Peter H. Wackman, deceased, late of Wauwatosa, Wis. (by Connie M. Wackman, personal representative), assignors to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 420,558, Sep. 20, 1982, Pat. No. 4,536,884. This application Sep. 13, 1984, Ser. No. 651,052

Int. Cl.[4] G21K *5/00;* **H01L** *21/302*

U.S. Cl. 378—34 **14 Claims**



1. Apparatus for fine line X-ray lithography comprising:

means for repeatably generating vapor directly from solid material;

means including axially spaced electrodes for generating X-rays by passing high current axially between said axially spaced electrodes through said vapor causing magnetic field plasma pinching radially inwardly perpendicularly to the axial current flow; and

a masked semiconductor substrate axially spaced from said vapor generating means and said X-ray generating means and disposed normal to said axial direction.

4,618,972

X-RAY SOURCE COMPRISING DOUBLE-ANGLE CONICAL TARGET

George E. Georgiou, Gillette, and Martin E. Poulsen, New Providence, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 7, 1984, Ser. No. 648,021

Int. Cl.[4] H01J *35/08*

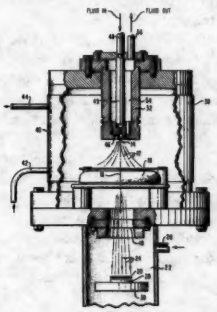
U.S. Cl. 378—34 **13 Claims**

13. An X-ray lithographic system for irradiating a mask member that is registered in a spaced-apart relationship with respect to a wafer member coated with a resist material, said system comprising

a conical target electrode having an interior inclined surface comprising a conical apex portion and a conical base portion,

and means for directing substantially the entirety of a beam of electrons at said interior surface of said apex portion to produce X-ray emission therefrom,

wherein the improvement resides in that the material of the interior surface of said apex portion is selected to provide, in response to electron bombardment thereof, X-rays whose wavelength propagates through said system with relatively little attenuation to impinge upon said resist



material within the sensitivity range of said material, and wherein the material of the interior surface of said conical base portion is selected to insure that only a relatively low intensity of any X-rays emitted therefrom in the direction of said wafer member propagate through said system and impinge upon said resist material within the sensitivity range of said material.

4,618,973

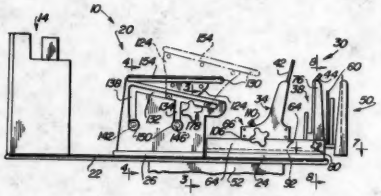
MAMMOGRAPHIC X-RAY APPARATUS

Harold J. Lasky, 716 Roslyn Pl., Evanston, Ill. 60201

Filed Nov. 1, 1985, Ser. No. 794,048

Int. Cl.[4] A61B *6/04;* **G03B** *41/16*

U.S. Cl. 378—037 **10 Claims**



1. An apparatus to facilitate the X-ray examination of the breast of a female subject and including:

a radiation source and means for directing said source to impinge upon target tissue to be examined,

radiation energy sensor means responsive to radiation emanating from said radiation source and impinging on said sensor means to provide a visual image of said tissue,

wall means for confining said tissue to be examined and for applying controlled compression force thereto during exposure of said tissue to said radiation source,

said means for confining said tissue including spaced wall means disposed positively to engage said tissue gravitationally suspended therebetween,

at least one of said wall means comprising a sheet of material transparent to visible light to facilitate viewing of the positioning of the breast to ensure proper placement for radiographic display,

means for shifting said wall means relative to each other to establish selectable spacing correlated with associated compression forces applied by said wall means to said

tissue to establish a controlled through thickness field of said tissue presented to said radiation source and to provide more uniform density in visual images produced,

the improvement comprising:

generally horizontally extending table means interposed intermediate said radiation source and said wall means for supporting a body component of the subject thereon and for shielding said body component from irradiation during radiographic examination of the subject,

means for manipulatively positioning said table means in a selectable mode correlated with a particular physical attitude assumed by the subject and dictated by orientation of the tissue being examined,

guide means for delineating optional positions of said table means,

said guide means including channel means and shaft means slidably disposed in said channel means, said shaft means cooperating with said channel means to delineate optional paths of movement of said table means,

means supporting said table means in said guide means, and locking means for securing said table means in said guide means at a selectable positional and angular orientation.

4,618,974

DENTAL X-RAY DIAGNOSTIC UNIT

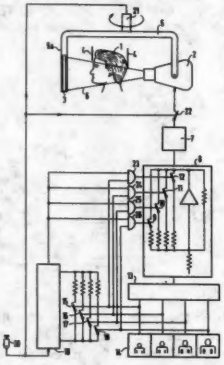
Ulrich Grassme, Nuremberg, and Erich Noske, Weiher, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 3, 1984, Ser. No. 576,583

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 3304271

Int. Cl.⁴ G03B *41/16*

U.S. Cl. 378—40 **2 Claims**



1. An improved dental X-ray diagnostic unit for producing panoramic planigraphs of an object of a type having:

(a) a radiation source;

(b) a cassette for holding an X-ray film substantially diametrically opposite said radiation source;

(c) an adjusting mechanism for moving said radiation source and said cassette around said object; and

(d) a slit stop located in the radiation path between said radiation source and said cassette for limiting a radiation beam generated by said radiation source,

wherein the improvement comprises switching devices for varying intensity of the X-ray beam during the exposure of said object to said radiation beam, said switching devices further including pushbutton switching devices for selecting a desired X-ray dosage.

4,618,975

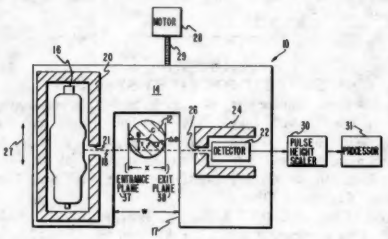
METHOD AND APPARATUS FOR ANALYZING A POROUS NONHOMOGENEOUS CYLINDRICAL OBJECT

Werner J. Glantschnig, Belle Mead, N.J., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Dec. 21, 1984, Ser. No. 684,950

Int. Cl.⁴ G01N *23/06*

U.S. Cl. 378—51 **8 Claims**



5. An apparatus for nondestructively analyzing a porous, inhomogeneous object having n known molecular components (where n is an integer) comprising:

means for scanning the object with a beam of photons whose axis is perpendicular to the axis of the object, each photon having a distinct energy within at least one of n−1 energy groups;

means for measuring intensity of the photons upon passage through the object at each of a plurality of separate heights t_i of the beam as measured between the axis thereof and the center of the object;

means for establishing n−1 attenuation coefficients $\mu_1(r)$, $\mu_2(r) \ldots \mu_{n-1}(r)$ at each said height t_i of the beam in accordance with the measured intensity of the photons within a separate one of said n−1 energy groups, respectively; and

means for calculating the density $\rho(r)$ and the individual molecular mass fraction $X_1(r)$, $X_2(r)$, $X_3(r) \ldots X_n(r)$ of each of the n constituent molecular components of the object at said each height t_i of the beam in accordance with a separate one of the attenuation coefficients μ_1, $\mu_2 \ldots \mu_{n-1}$, respectively.

4,618,976

X-RAY DIAGNOSTIC INSTALLATION

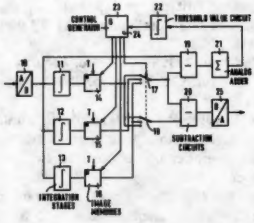
Joerg Haendle, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 13, 1984, Ser. No. 630,674

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1983, 3332317

Int. Cl.⁴ H05G *1/64*

U.S. Cl. 378—99 **5 Claims**



1. An X-ray diagnostic system for angiographic X-ray exam-

ination of a patient after injection of a contrast medium, said system comprising:

means for generating an X-ray beam directed at said patient;

an image intensifier/television chain including an image intensifier on which said radiation is incident, a video camera having an input connected to an output of said image intensifier for generating video signals, a processing circuit connected to an output of said camera for receiving said video signals therefrom, a monitor connected to said processing circuit for displaying an image comprised of said video signals, and a central control unit for controlling the video camera, the processing circuit and the monitor;

said processing circuit including at least three image memories, a control generator for generating clock pulses connected to said image memories for controlling entry of said video signals therein cyclically during respective clock pulse intervals by successively switching respective ones of the image memories to the right state for storing a current video signal averaged over several images therein, a first subtraction device to which the current video signal and the video signal for one image memory are supplied for forming a first difference video signal, a maximum detector connected to said first subtraction device for recognizing a maximum of the flow of said contrast medium in said patient and connected to the control generator for actuating said control generator for effecting storage of an image occurring at the maximum of said flow of said contrast medium, and a second subtraction device;

said control generator controlling the image memories such that, upon occurence of said maximum, the image memory which was last in the right state, and the image memory with the chronologically oldest video signal, are switched to the read state and are connected to said second subtraction device for forming a second difference video signal; and

said second subtraction device being connected to said monitor for displaying said second difference video signal.

4,618,977

X-RAY TUBE COMPRISING AN AT LEAST PARTLY METAL HOUSING AND AN ELECTRODE WHICH CARRIES A POSITIVE HIGH VOLTAGE WITH RESPECT THERETO

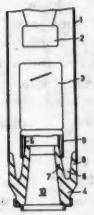
Horst Brettschneider, Tangstedt; Walter Hartl, and Diethard Peter, both of Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 436,121, Oct. 22, 1982. This application Dec. 9, 1985, Ser. No. 806,132

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 3142281

Int. Cl.⁴ H01J *35/16*

U.S. Cl. 378—139 **11 Claims**



1. An X-ray tube comprising an at least partly metal housing and an electrode which can be connected to a positive high voltage with respect thereto and which is mounted on a ceramic insulator projecting into the tube, a connection area between said electrode and said insulator being enclosed by a screening sleeve electrically connected to the electrode, wherein surrounding the insulator is provided a wall having an insulating inner surface and beingconnected to the metal housing, said screening sleeve projecting into a recess defined by the inner surface of the wall and an outer surface of the insulator, said recess having a bottom at a depth which is sufficient to ensure that the distance d between a bottom edge of the screening sleeve and the bottom of the recess is no smaller than $d=cU$, where c is a constant having an approximate value of 0.1 mm/kV and where U is the maximum voltage difference between the electrode and the housing.

4,618,978

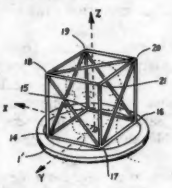
MEANS FOR LOCALIZING TARGET COORDINATES IN A BODY RELATIVE TO A GUIDANCE SYSTEM REFERENCE FRAME IN ANY ARBITRARY PLANE AS VIEWED BY A TOMOGRAPHIC IMAGE THROUGH THE BODY

Eric R. Cosman, 872 Concord Ave., Belmont, Mass. 02178

Filed Oct. 21, 1983, Ser. No. 544,090

Int. Cl.⁴ H05G *1/28*

U.S. Cl. 378—164 **1 Claim**



1. A localizer system that can be placed in a fixed spacial relationship to a body to be scanned by a scanning apparatus that produces scan images in which target images of a physical target in the body can be seen and can be related to specific coordinates of the physical target in the body relative to said localizer system, said localizer system comprising:

A. a localizer having an axial axis, said localizer comprising:

(i) at least twelve rod elements which lie on the edges of a right parallelapiped which can be defined mathematically in space relative to said localizer system;

(ii) at least three side diagonal rod elements which are not parallel to any of said rod elements, but each of said side diagonal elements being parallel to at least one of the four planar axial sides of said parallelapiped which are parallel to said axial axis;

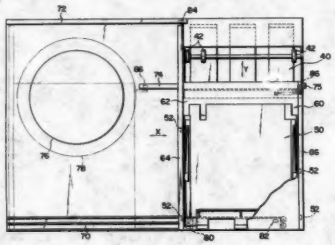
(iii) at least one top diagonal rod element which lies in a plane that is perpendicular to said axial axis and which is not parallel to any of the edges of said parallelapiped;

B. means for placing said localizer in a fixed relationship to the body to be scanned with the localizer axial axis being substantially parallel to the axis of the body to be scanned so that any reconstructed planar slice from a scan will lie in an arbitrary plane relative to the axes of said parallelapiped and intersect at least four of said rod elements and at least three of said diagonal elements and a slice image therefrom will contain identifiable image marks corresponding to the intersection of the planar slice with said elements, and so that if a target image is present in the slice image, the coordinates of the target in the body associated with said target image can be calculated.

4,618,979
X-RAY FLUOROSCOPIC/RADIOGRAPHIC APPARATUS

Katsuhide Koyama, Yaita, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Jun. 1, 1984, Ser. No. 616,151
Claims priority, application Japan, Jun. 3, 1983, 58-99151
Int. Cl.[4] G03B 42/02
U.S. Cl. 378—176 8 Claims



1. An X-ray fluoroscopic/radiographic apparatus for photographing an X-ray image on a film, comprising:

carriage means movable along an X axis for conveying the film between a standby position, where said carriage means receives and supplies the film, and a photographing position, where the X-ray image is photographed on the film, said standby and photographing positions being separated by a first prescribed distance L along said X axis;

a plurality of guide rails extending parallel to each other along said X axis from said standby position to said photographing position of said carriage means;

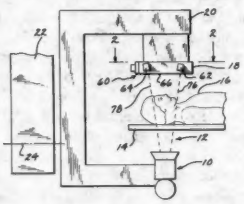
a plurality of guided members mounted on said carriage means, each of said guided members being engageable with and movable along one of said plurality of guide rails; and

support means mounted on said carriage means for supporting at least one of said guided members, said support means being movable relative to said carriage means by a second prescribed distance S along said X axis, said guided member supported by said support means being moved by a distance equal to L minus S along said guide rail corresponding thereto when said carriage means moves from said standby position to said photographing position.

4,618,980
EXIT BEAM INDICATOR FOR RADIOGRAPHIC EQUIPMENT

Charles Lescrenier, 660 Crescent Dr., Wauwatosa, Wis. 53213, and Val Bautista, Spring Grove, Ill., assignors to Charles Lescrenier, Wauwatosa, Wis.

Filed Sep. 12, 1984, Ser. No. 650,306
Int. Cl.[4] A61B 6/08
U.S. Cl. 378—206 13 Claims



1. An indicator for indicating at least one dimension of a X-ray beam diverging from an X-ray source, said X-ray source being located on one side of an object and the X-ray beam exiting on a second side of the object, the X-ray beam being defined by movable collimator means and having an axis, said indicator comprising:

a base member positioned on the second side of the object;

a pair of light sources mounted on said base member for generally linear movement toward and away from each other normal to the axis of the X-ray beam and for angular movement about an axis normal to the direction of linear movement of the light sources and the axis of the X-ray beam, said light sources providing beams of light for application to the second side of the object and capable of defining one dimension of said X-ray beam;

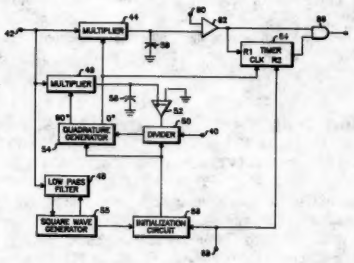
operating means for providing linear and angular movement of the light sources; and

control means connected to said operating means and couplable to the collimator means for causing said operating means to move said light sources so that the beams of light are congruent with the edges of the X-ray field, as defined by the collimator means, and converge at the source of the X-ray beam.

4,618,981
TONE DETECTOR WITH PSEUDO PHASE LOCKED LOOP

Lawrence M. Ecklund, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 28, 1985, Ser. No. 706,583
Int. Cl.[4] H04H 5/00
U.S. Cl. 381—15 1 Claim



1. A tone detector comprising:

an input means for providing a received signal which may contain a tone of a predetermined frequency;

a signal source for providing a signal having a second frequency, the second frequency being much higher than said predetermined frequency;

divider means coupled to said signal source and having two divisor numbers for providing a first output signal slightly higher than said predetermined frequency and a second output signal slightly lower than said predetermined frequency, only one of said divisor numbers being enabled at a time;

control means coupled to the input means and to the divider means for determining the frequency difference between any received tone signal and the divider output and adjusting the choice of divisor number to maintain the average of the divider output at the predetermined frequency;

phase shifting means coupled to the divider means for shifting a divider means output signal by 90°;

detect means coupled to the input means and to the phase shifting means for detecting the tone frequency in the received frequency, determining the amplitude of the tone frequency and providing an output signal in response to said amplitude.

4,618,982
DIGITAL SPEECH PROCESSING SYSTEM HAVING REDUCED ENCODING BIT REQUIREMENTS

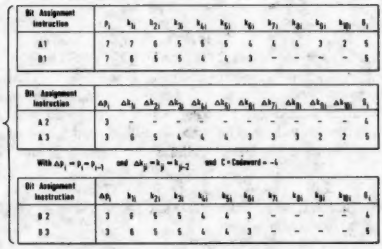
Stephan Horvath, and Carlo Bernasconi, both of Zurich, Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Sep. 23, 1982, Ser. No. 421,884

Claims priority, application Switzerland, Sep. 24, 1981, 6168/81

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—36 **15 Claims**



Bit Assignment Instruction												
A1	7	7	6	5	5	5	4	4	4	3	2	5
B1	7	6	5	5	4	4	3	–	–	–	–	5

Bit Assignment Instruction												
A2	3	–	–	–	–	–	–	–	–	–	–	4
A3	3	6	5	4	4	4	3	3	3	2	2	5

With $\Delta b_1 = b_1 - b_{1-1}$ and $\Delta b_2 = b_2 - b_{2-2}$ and C = Codeword = –4

Bit Assignment Instruction												
B2	3	6	5	5	4	4	3	–	–	–	–	4
B3	3	6	5	5	4	4	3	–	–	–	–	5

1. In a linear prediction speech processing system wherein a digital speech signal is divided in the time domain into sections and each section is analyzed to determine the parameters of a speech model filter, a volume parameter and a pitch parameter, a method for coding the determined parameters to reduce bit requirements and increase the frame rate of transmission of the parameter information for subsequent synthesis, comprising the steps of:

combining the determined parameters of at least two successive speech sections into a block of information;

coding the determined parameters for the first speech section in said block in complete form to represent their magnitudes; and

coding at least some of the parameters in the remaining speech sections in said block in a form representation of their relative difference in magnitude from the corresponding parameters in said first speech section.

4,618,983
SPEECH RECOGNITION WITH PRELIMINARY MATCHING

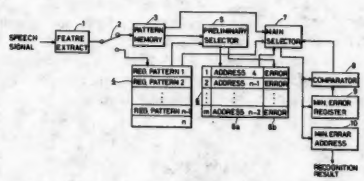
Yoshiki Nishioka, Tenri; Mitsuhiro Hakaridani, Nara, and Hiroyuki Iwahashi, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1982, Ser. No. 452,298

Claims priority, application Japan, Dec. 25, 1981, 56-210605

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—43 **8 Claims**



1. A method of recognizing audible speech made up of a plurality of speech patterns comprising:

(a) providing a plurality of reference speech patterns, each said reference speech pattern being divided into a predetermined number of feature frames;

(b) introducing a speech signal including at least one speech pattern to be recognized;

(c) dividing said speech pattern to be recognized into said predetermined number of feature frames, said frames of said speech pattern to be recognized corresponding in time to said frames of each said reference pattern;

(d) comparing said speech pattern to be recognized to said reference pattern, in only a portion of said predetermined number of feature frames to determine a coarse indication of relative correlation therebetween;

(e) ranking said reference patterns as to relative degree of correlation with speech patterns to be recognized as represented by said coarse indication developed by said step of comparing, the highest ranking indicating the highest coarse indication of related correlation;

(f) determining a final degree of correlation between only the highest ranked of said reference patterns and said speech pattern to be recognized to determine which reference pattern corresponds to said speech pattern to be recognized.

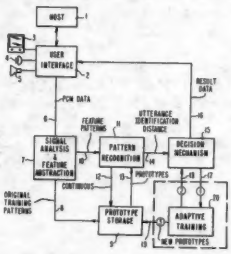
4,618,984
ADAPTIVE AUTOMATIC DISCRETE UTTERANCE RECOGNITION

Subrata K. Das, Granite Springs, and Norman R. Dixon, Katonah, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 8, 1983, Ser. No. 502,415

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—43 **4 Claims**



1. A method of adaptive automatic discrete utterance recognition comprising:

(a) providing the system with a single utterance set of prototype vocabulary keywords;

(b) operating the system until a misrecognized utterance is detected;

(c) prompting a prompted prototype vocabulary keyword candidate utterance;

(d) calculating recognition distances for the unrecognized utterance, the prompted prototype vocabulary keyword candidate utterance, and the prototype vocabulary keyword;

(e) comparing the calculated recognition distances; and

(f) selectively accepting as prototype vocabulary keyword the prototype vocabulary keyword candidate utterance as a function of said step of comparing the calculated recognition distances.

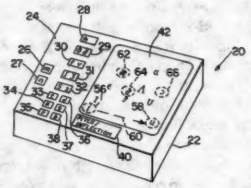
4,618,985
SPEECH SYNTHESIZER

J. David Pfeiffer, 64 Côte St. Charles, Box 470, Hudson Heights, Québec, Canada (J0P 1J0)

Continuation of Ser. No. 391,981, Jun. 24, 1982, abandoned. This application Jul. 22, 1985, Ser. No. 757,205

Int. Cl.⁴ G10L *5/00*

U.S. Cl. 381—51 **40 Claims**



1. A speech sound generating system comprising:

means for simulating the frequency response of the vocal tract, said frequency response including two or more resonant peaks or formants continuously movable in frequency, said means for simulating the frequency response of the vocal tract comprising a tunable formant filter for each of said formants;

means continuously responsive to operator input for simultaneously and continuously controlling the frequency locations of each of said formants by continuously tuning said tunable formant filters;

means for simulating electrically the vibration of the vocal cords, with variable pitch period;

additional means continuously responsive to operator input for controlling said vocal cord pitch variation;

means combining said vocal cord simulation with said frequency response simulation of the vocal tract to produce a resulting waveform; and

transducing means to cause the resulting waveform to be emitted as an audible sound.

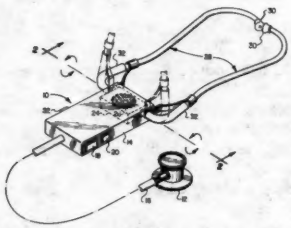
4,618,986
ELECTRONIC STETHOSCOPE

Larry H. Hower, New York, N.Y., assignor to The Hart Group, Dallas, Tex.

Continuation-in-part of Ser. No. 480,062, Mar. 29, 1983. This application Nov. 4, 1983, Ser. No. 549,195

Int. Cl.⁴ A61B *5/02*

U.S. Cl. 381—67 **8 Claims**



1. An electronic stethoscope comprising:

an electronic component case for encompassing electronic components in circuitry;

a pickup head;

a microphone;

a first tubular acoustic member coupling said pickup head and said microphone;

a binaural headpiece;

a speaker mounted within said electronic component case;

an amplifier circuit having its input coupled to said microphone and its output coupled to said speaker;

a rotatable tubular member disposed adjacent to said speaker and extending out through each side of said electronic component case for coupling the output of said speaker out of said electronic component case; and

means coupling said binaural headpiece to said rotatable tubular member whereby said binaural headpiece may be rotated with respect to said electronic component case for ease in storage of said electronic stethoscope.

4,618,987
LARGE-AREA ACOUSTIC RADIATION SYSTEM

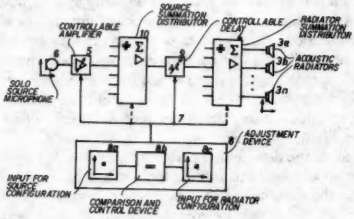
Gerhard Steinke; Peter Fels; Wolfgang Hoeg; Werner Lorenz; Wolfgang Ahnert, all of Berlin; Frank Steffen, Blankenfelde, and Walter Reichardt, Dresden, all of German Democratic Rep., assignors to Deutsche Post, Rundfunk-und Fernsehtechnisches Zentralamt, Berlin-Adlershof, German Democratic Rep.

Filed Sep. 6, 1984, Ser. No. 647,951

Claims priority, application German Democratic Rep., Dec. 14, 1983, 257890

Int. Cl.⁴ H04R *1/22*

U.S. Cl. 381—82 **12 Claims**



1. In a large-area sound reinforcement system for multidimensional extended action and reception areas having several distributed sound radiators and microphones as well as devices for the delay, amplification and non-reactive summation in the microphone sound radiator connections, at least one of the microphones being assigned to a solo source; the improvement wherein at least two of the devices for the delay and for amplification disposed in connections assigned to said one microphone comprise a device for the control of delay times and at least another for the control of amplitudes, wherein, in addition to sound radiators positioned in the transitional area between the action area and the reception area, additional sound radiators distributed in the action area are connected to the output devices for the summation and distribution of said connections, and wherein a control device for said two devices for delay and amplification is comprised of input means for receiving microphone position and sound source power data and for receiving sound radiator position and power data, and a comparison and control device for deriving delay time and amplitude signals for the control of said two of said devices for delay and amplification from the comparison of said position and sound power data.

4,618,988
MATCHER

Michael Schiller, Riverdale, N.Y., assignor to Fingermatrix, Inc., North White Plains, N.Y.

Filed Jul. 25, 1984, Ser. No. 634,410

Int. Cl.⁴ G06K *9/00*

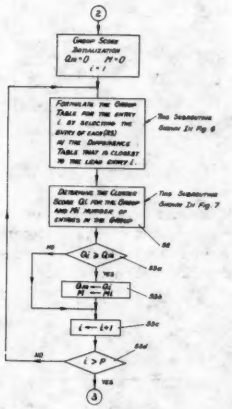
U.S. Cl. 382—5 **49 Claims**

1. In the method of matching a set of subject identification points against a set of reference identification points involving

a matcher mechanism that employs a difference table, the improvement comprising the steps of:

optically scanning the surface of an object that is deemed to be a subject input to provide said set of subject identification points substantially unique to the object being scanned,

for each line entry on the difference table as a lead entry, providing a group of difference table line entries, limiting each group so provided to no more than one line entry for each of said reference identification points,



for each of said groups, providing a quality value determined by a weighted relationship between the relative displacements of the various line entries in the group,

selecting the most significant group quality value, and

verifying a match between the set of subject points and the set of reference points as a function of the relative magnitude of the most significant quality value as compared to the number of identification points in a first one of said sets.

4,618,989

METHOD AND SYSTEM FOR DETECTING ELLIPTICAL OBJECTS

Hideo Tsukune, Kashiwa, and Keisuke Goto, Tokyo, both of Japan, assignors to Michio Kawata, Director-General of Agency of Industrial Science and Technology and Kabushiki Kaisha Meidensha, both of, Japan

Filed Jan. 19, 1984, Ser. No. 572,535

Claims priority, application Japan, Jan. 21, 1983, 58-8156

Int. Cl.[4] G06K 9/46

U.S. Cl. 382—25 **18 Claims**

1. A method of detecting an elliptical object, which comprises the following steps of:

(a) transducing optical energy representative of image brightness of all locations (x, y) on an image plane including the elliptical object into electric brightness signals;

(b) partially differentiating the transduced brightness signals with respect to x and y to obtain gradient signals representative of edge image brightness gradient $I=(\partial I/\partial x, \partial I/\partial y)$;

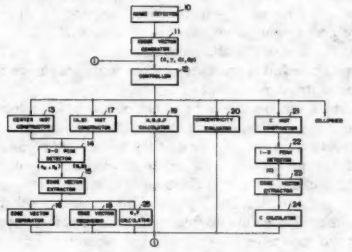
(c) generating edge vector signals representative of locations (x,y) and directions (dx,dy) of an edge vector field in perpendicular to the edge image brightness gradient I in a direction such that the bright image will always be on one side of the vector signals;

(d) selecting the edge vector signals representative of all pairs of mate edge vectors having opposite directions to each other and calculating all midpoints ($n_1+n_2=0$) between the two selected mate edge vectors;

(e) selecting a center signal having a center peak value (x_o, y_o) from the calculated midpoints;

(f) selecting vector signals representative of the locations (x, y) and directions (dx, dy) of the edge vectors supporting the centered conics having the selected center peak value (x_o, y_o) from the edge vector field signals;

(g) transforming the selected values (x, y, dx, dy) of the edge vector signals to a first two-dimensional ($p=(YdX+XdY)/YdY$, $Q=XdX/YdY$) space to form a first straight line and calculating all intersections of second straight lines corresponding to each transformed point on the first straight line in a second two-dimensional (H, B) space in accordance with a Hough transformation method;



(h) selecting a signal having a peak value located within a specific range ($H^2-B<0$) on the (H, B) space for detecting an ellipse;

(i) calculating coefficients $G=-X_o-Hy_o$ and $F=-Hx_o-By_o$ of an ellipse group having the same center on the basis of the selected coefficients H, B and the selected center locations (x_o, y_o);

(j) calculating coefficients C on the basis of the calculated coefficients H, B, G, F and the edge vector locations (x, y); and

(k) selecting a peak value from the calculated coefficients C to identify a detected ellipse.

4,618,990

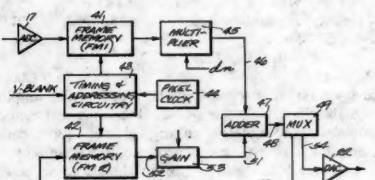
EDGE ENHANCEMENT FILTERING FOR DIGITAL FLUOROGRAPHY IMAGES

Lawrence E. Sieb, Jr., Oconomowoc, and David G. Mliner, New Berlin, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 15, 1984, Ser. No. 671,746

Int. Cl.[4] G06K 9/40

U.S. Cl. 382—43 **1 Claim**



1. A method of enhancing edges in a fluorographic image obtained with a video camera and converted to digitized picture elements (pixels) which contain frequency components corresponding to true image information and higher frequency components corresponding to noise, comprising the steps of:

determining the filter function, d_n in the time domain required for accentuating frequency components corresponding to edges in the image by calculating

$$d_n = \frac{1}{\omega_s} \int_{-\frac{\omega_s}{2}}^{\frac{\omega_s}{2}} D(j\omega) e^{j\omega nT} d\omega$$

where:

ω_s=pixel sampling frequency

$T = 1/\omega_s$

n=an integer from $-\infty$ to ∞

D(jω)=filter frequency response

d_n=Fourier coefficients

to thereby obtain a series of filter coefficients over the integral from $-\omega_s/2$ to $\omega_s/2$, where the "n" selected are finite integral numbers in the range of $-n$ to $+n$ corresponding to the left and right and up and down pixel shifts desired,

storing the Fourier coefficients, d_n,

storing in one full frame memory the digitized image that is to have its edges enhanced,

each time a video vertical blanking pulse occurs effecting a time delay corresponding to a number of pixels at said sampling frequency for one of the values of "n" and then reading out the pixel values from said one memory to thereby effectively shift the images readout from said one memory to the left and right and up and down relative to said image stored in said one memory by numbers of pixels through the range of $-n$ to n, and when the first shifted image is read out multiplying it by the coefficient d_n corresponding to the value of "n" by which the image is shifted and storing this image in a second full frame memory, then as each subsequent image is read out multiplying it by a coefficient, d_n, corresponding to "n" and adding it to the sum of the previously read out and multiplied images and each time storing the result in said second memory such that when a number of images corresponding to the number of images from $-n$ to n said second memory will contain an edge map image represented by digital pixel values corresponding only to edges,

next summing the edge map image from said second memory with said original image from said first memory to thereby enhance the edges in the original image,

converting the digital result of said summing to analog video signals and using the analog video signals to drive a video monitor for facilitating visualization of the edge enhanced image.

4,618,991

PROCESSING METHOD FOR THE ROTATION OF AN IMAGE

Kuniaki Tabata, Nishitama, and Haruo Takeda, Machida, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 23, 1984, Ser. No. 613,189

Claims priority, application Japan, May 23, 1983, 58-89119; Nov. 2, 1983, 58-204826

Int. Cl.[4] G06K *9/32*

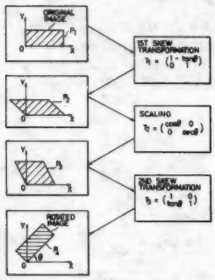
U.S. Cl. 382—46 **8 Claims**

1. An image rotation processing method for transforming the address signals identifying the storage locations in memory where there are stored signals of an original image represented in two-dimensional orthogonal coordinates into the address signals of memory locations for storing signals of an image rotated by an angle θ (radians) with respect to said original image, comprising:

a first step of transforming the address signals of the memory storage locations of said original image into address signals of memory storage locations which are represented on skew coordinates making an intersectional angle θ (radians) with respect to one of said orthogonal coordinates;

a second step of conducting reduction of the transformed address signals substantially of cos θ in the direction of one axis of said orthogonal coordinates and enlargement substantially of sec θ (or cosec θ) in the direction of the other axis; and

a third step of transforming the reduced/enlarged address signals into address signals of memory storage locations which are represented on skew coordinates making an intersectional angle θ (radians) with respect to the other one of said orthogonal coordinates.



4,618,992

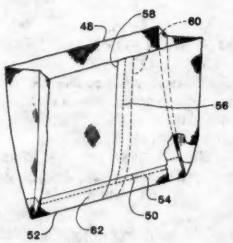
BAG CONVERTABLE TO PLACE MAT

Julius K. La Grotteria, 607 E. Lee Dr., Santa Maria, Calif. 93454

Filed Dec. 6, 1984, Ser. No. 678,789

Int. Cl.[4] B65D *33/00, 30/10*

U.S. Cl. 383—4 **1 Claim**



1. In a bag of the type that is formed by overlapping two opposite edges of a rectangular sheet of material to form a tube that includes an overlapped strip, then folding one end portion of the tube back upon itself to form a trough-shaped bottom, the improvement comprising:

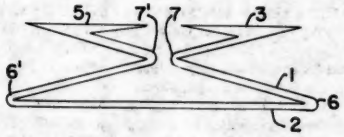
a first row of tearing perforations extending through the end portion of the tube that was folded back on itself, adjacent and generally parallel to the trough-shaped bottom; and,

a second row of tearing perforations extending within the overlapped strip from said first row of tearing perforations to the open end of the bag, whereby after all of the tearing perforations have been torn, the material of the bag can be spread out flat to serve as a place mat, and this result is achieved without appreciably weakening the bag.

4,618,993
VALVE BAG

Ernst R. Berthelsen, Terndrup, Denmark, assignor to Dac-Emballage A.M.B.A., Denmark

Filed Apr. 29, 1983, Ser. No. 490,018
Int. Cl.[4] B65D *30/24*
U.S. Cl. 383—44 5 Claims

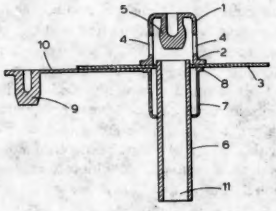


1. A valve bag, comprising;
(a) a substantially flat upper bottom, including a valve adapted for insertion of a filling spout,
(b) a substantially flat lower bottom,
(c) an elongated central portion disposed between said upper and lower bottom, said central portion including a first and second sets of fold lines, said fold lines being perpendicular to the direction of elongation of the central portion, each of said first set of fold lines being disposed between the center line of the central portion and the bottoms and each of the second set of fold lines being disposed between the first lines and the bag bottoms,
(d) where the bag is symmetrically folded along the first and second fold lines so that the upper and lower bottoms lie on the central portion in a side-by-side and parallel manner.

4,618,994
TAPS

David C. Bishop, Portslade, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Aug. 1, 1984, Ser. No. 636,826
Claims priority, application United Kingdom, Aug. 2, 1983, 8320783
Int. Cl.[4] B65D *33/16, 33/38*
U.S. Cl. 383—96 5 Claims

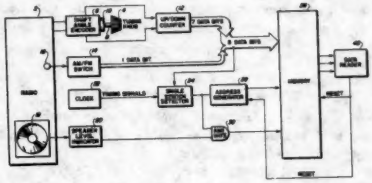


1. A container for liquids having a tap comprising a first valve member including a cap secured to the container and having a drainage hole leading into the cap and a male valve plug in the cap; a second valve member including a tubular female valve element which is engageable with the male valve plug to close the tap, but which is disengageable to open the tap, and a flexible sheath which is secured to and encloses part of the female valve element and which is connected with the cap in a fluid-tight manner and permits relative movement between the two valve members.

4,618,995
AUTOMATIC SYSTEM AND METHOD FOR MONITORING AND STORING RADIO USER LISTENING HABITS

Saundra R. Kemp, 114 Davis Ave., Staten Island, N.Y. 10310

Continuation-in-part of Ser. No. 549,800, Nov. 9, 1983, abandoned. This application Apr. 24, 1985, Ser. No. 726,672
Int. Cl.[4] H04H *9/00*; H04B *17/00*
U.S. Cl. 455—2 14 Claims

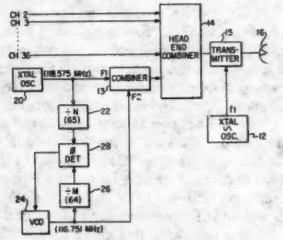


13. A method of monitoring and storing the listening habits of a radio user, comprising:
providing a one bit digital output to indicate whether a radio is tuned to the AM band or the FM band;
providing a seven bit digital output to indicate what particular radio station said ratio is tuned to;
checking over a two minute period to see if the eight bits including said one bit and said seven bits remain constant for at least a one minute period during said two minute period;
storing said eight bits in a memory location of a memory once each two minute period if said eight bits remained constant for at least said one minute period during said two minute period and said radio is playing at an audible level;
repeating the above steps every two minutes and moving to a new memory location each time each eight bits are stored in said memory.

4,618,996
DUAL PILOT PHASE LOCK LOOP FOR RADIO FREQUENCY TRANSMISSION

Marc D. Rafal, Durham; Larry W. Burton, Bahama, and William T. Joines, Durham, all of N.C., assignors to Avnet, Inc., New York, N.Y.

Filed Apr. 24, 1984, Ser. No. 603,432
Int. Cl.[4] H04B *1/04, 1/30*
U.S. Cl. 455—46 11 Claims



11. A radio frequency transmitter for use in producing a suppressed-carrier radio frequency signal F_1 containing at least one coherently modulated information signal and two pilot tones, comprising:
a crystal oscillator producing a pilot tone F1 at a frequency unrelated to the suppressed carrier f_1;

a controllable local oscillator producing a second frequency F2, wherein F1=N/M F2, where N and M are integers;

means for combining the outputs of the crystal oscillator and controllable local oscillator, and applying them to the suppressed carrier modulator along with the at least one coherently modulated information signal;

means for dividing the crystal oscillator signal by the integer value N;

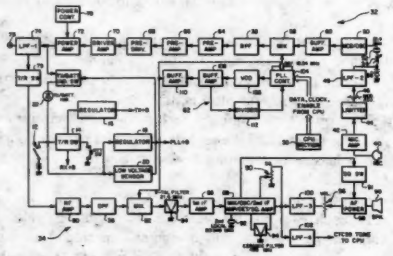
means for dividing the controllable local oscillator signal by the integer value M; and

means for comparing the divided outputs to produce a control signal controlling the local controllable oscillator.

4,618,997
PORTABLE TRANSCEIVER

Kazuyoshi Imazeki; Toshiyuki Tanaka, and Hiromichi Miyakoshi, all of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 592,825
Int. Cl.[4] H04B *1/40*
U.S. Cl. 455—76 **15 Claims**

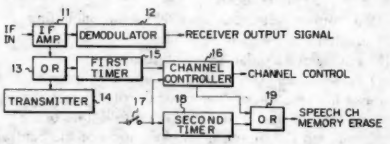


1. A microprocessor-controlled frequency-synthesized radio transceiver system comprising: frequency synthesizing means; microprocessor means for controlling the synthesis by said frequency synthesizing means of local-oscillator frequencies for both the transmitting and receiving of radio signals, said microprocessor means having a predetermined capacity for storage of data smaller than the capacity required to store sufficient data to control the synthesis of local-oscillator frequencies for a first plurality of radio frequencies comprising defined broadcast frequencies extending over a predetermined band of radio frequencies between given upper and lower frequency limits; transmitter circuit means and receiver circuit means, each capable of operating at all radio frequencies within said predetermined band; said transmitter circuit means and said receiver circuit means being respectively operatively coupled with said frequency synthesizing means; and control input means for programming said microprocessor means to control the synthesis of local-oscillator frequencies for a second plurality of radio frequencies comprising fewer than all of said first plurality of radio frequencies and requiring a quantity of data which is within the predetermined data storage capacity of the microprocessor means; wherein said frequency synthesizing means comprises phase-locked loop means coupled with said microprocessor means for synthesizing a plurality of local-oscillator frequencies including local-oscillator frequencies for all of the radio frequencies within said predetermined band; said microprocessor means being operative for producing predetermined control signals including data corresponding to local-oscillator frequencies for said second plurality of frequencies; said phase-locked loop means including PLL control means responsive to said predetermined control signals for controlling synthesis of corresponding local-oscillator frequencies, and dual-modulus selection means responsive to a predetermined one of said predetermined control signals for controlling synthesis of a first group of local-oscillator frequencies in response to predetermined corresponding data from said microprocessor; said dual-modulus selection means being further responsive to a second predetermined one of said predetermined control signals for controlling synthesis of a second group of local-oscillator frequencies in response to the same predetermined corresponding data from said microprocessor means.

4,618,998
RADIO COMMUNICATIONS CONTROL SYSTEM WHICH AUTOMATICALLY RETURNS THE SYSTEM TO THE SPEECH CHANNEL

Katsuaki Kawamura, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 29, 1983, Ser. No. 537,011
Claims priority, application Japan, Sep. 30, 1982, 57-171576
Int. Cl.[4] H04B *1/40*; H04Q *7/00*; H04M *11/00*
U.S. Cl. 455—77 **2 Claims**



1. A radio communications system including a plurality of stations using a call channel and a plurality of speech channels one of which is to be selected to convey information, each of said stations comprising:

a receiving part for receiving a radio signal transmitted by another station;

a transmitting part for transmitting a radio signal modulated in accordance with various information; and

a control circuitry for controlling said receiving and transmitting parts which includes,

a channel control means connected to said receiving part and said transmitting part for determining a receiving frequency of said receiving part and a frequency of a transmitting radio signal from said transmitting part, among frequencies of said call channel and said plurality of speech channels;

a speech channel memory means connected to said channel control means for temporarily memorizing a frequency data of a speech channel on which an activity is taking place;

a manually operable reset switch for transmitting a reset command signal to said channel control means for resetting the frequency of the system at said call channel;

a first timer means connected to said receiving part, said transmitting part, and said channel control means, for detecting a condition that none of said radio signals is present in said receiving and transmitting parts and transmitting a first timer output signal to said channel control means with a delay of a first predetermined time period after the detection of said condition, thereby controlling said channel control means to reset the frequency of the system at said call channel after the delay of said first predetermined time period; and

a second timer means connected to said manually operable reset switch and said channel control means and to said speech channel memory means, and responsive to said reset command signal and transmitting an erase command signal to said speech channel memory means with a delay of a second predetermined time period after a reception of said reset command signal, thereby delaying an erasure of said frequency data memorized in said speech channel memory means so that a last used speech channel can be recalled by said channel control means from said speech channel memory means.

4,618,999
POLAR LOOP TRANSMITTER

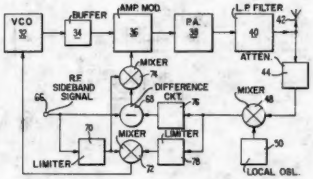
Stephen W. Watkinson, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 577,945, Feb. 8, 1984, abandoned. This application Sep. 9, 1985, Ser. No. 774,373

Claims priority, application United Kingdom, Feb. 23, 1983, 8304975

Int. Cl.[4] H04B *1/04*

U.S. Cl. 455—108 **9 Claims**



1. In a polar loop transmitter comprising a voltage controlled oscillator, an amplitude modulator connected to receive the output of said voltage controlled oscillator, an output circuit coupled to the amplitude modulator, means coupled to the output circuit for producing an attenuated down-converted signal, a source of radio frequency signals and a feed back circuit connected to the source and down-converting means for producing a control signal for said amplitude modulator;

the improvement wherein said feedback circuit comprises difference circuit means for producing a difference signal whose instantaneous value is the difference between the instantaneous values of said down-converted signal and radio frequency signals, amplitude demodulator means for amplitude demodulating said difference signal, and means applying the thus demodulated signal to said amplitude modulator as a control signal.

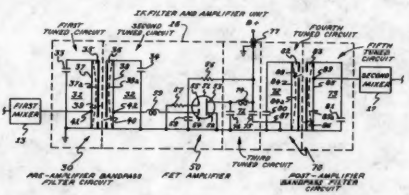
4,619,000
CATV CONVERTER HAVING IMPROVED TUNING CIRCUITS

John Ma, 499 Dundee Ave., Milpitas, Calif. 90535

Filed Sep. 24, 1984, Ser. No. 654,201

Int. Cl.[4] H04B *1/18*; H03J *1/26, 1/16*

U.S. Cl. 455—131 **7 Claims**



1. A filter for use in a CATV converter which receives a wideband CATV signal comprising a plurality of channel bandwidths and converts said wideband CATV signal to a narrowband signal comprising a single channel bandwidth by applying said wideband signal to said filter to obtain said narrowband signal, said filter comprising a first tunable resonant circuit excited in response to said wideband signal, said first tunable circuit including a fixed capacitive element coupled to a variable inductance means for tuning said first tunable resonant circuit; a second tunable resonant circuit including a fixed capacitive element coupled to a variable inductance means for tuning said second tunable resonant circuit, said narrowband signal being received from said second tunable circuit; and a means for substantially shielding said first tunable resonant circuit from said second tunable resonant circuit, said first tunable resonant circuit being transmissively coupled to said second tunable resonant circuit through an aperture in said sheilding means, wherein at least one of said variable inductance means is provided by a wire disposed in proximity to and spaced from said shielding means, and wherein the inductance of said variable inductance means provided by said wire resonates with the respective fixed capacitive element to which it is coupled and said inductance is varied by adjusting the spacing of said wire from said shielding means in order to tune the tunable circuit including said wire.

4,619,001
TUNING SYSTEMS ON DIELECTRIC SUBSTRATES

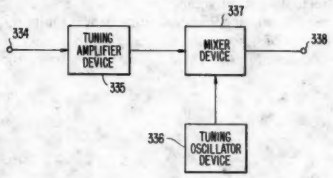
Johji Kane, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

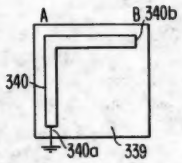
Filed Aug. 1, 1984, Ser. No. 636,666

Claims priority, application Japan, Aug. 2, 1983, 58-141543; Aug. 3, 1983, 58-143056; Aug. 3, 1983, 58-143057; Aug. 3, 1983, 58-143058; Aug. 3, 1983, 58-143062; Aug. 4, 1983, 58-143247; Aug. 4, 1983, 58-143248; Aug. 4, 1983, 58-143260

Int. Cl.[4] H04B *1/26*; H03F *3/191*; H03B *5/18*; H03J *3/00*

U.S. Cl. 455—192 **49 Claims**





28. A superheterodyne tuning system comprising:

a tuning oscillator circuit for producing a tuning oscillating signal;

a selective tuning amplifier circuit for amplifying a received signal to obtain a selective tuning amplified signal;

a mixer circuit for mixing said selective tuning amplified signal and said tuning oscillating signal thereby to obtain an intermediate frequency signal; and

an equivalent parallel resonant circuit comprising:

a dielectric; and

a pair of first and second electrodes confronting each other with said dielectric interposed therebetween, each of said first and second electrodes having at least one bent portion to present primarily a lumped-constant inductance and having a desired equivalent electrical length;

said first and second electrodes having ground or common terminals located out of mutually confronting positions so that voltage signals induced by mutual induction between the electrodes will be opposite in phase with respect to each other, thereby producing a parasitic distributed-constant capacitance due to a potential difference between the electrodes and a dielectric constant of the dielectric;

one of said first and second electrodes having a first terminal at a desired position thereof, the electrodes forming a two-terminal circuit network having the first terminal with the ground or common terminals serving as a second

terminal, the two-terminal circuit network forming said equivalent parallel resonant circuit composed of a lumped-constant inductance formed by said one electrode and a parasitic distributed-constant capacitance between the first and second electrodes;

wherein at least one of an oscillation output terminal of said tuning oscillator circuit, an amplifying output terminal of said selective tuning amplifier circuit and a mixing output terminal of said mixer circuit is connected to said first terminal of said equivalent parallel resonant circuit.

4,619,002

SELF-CALIBRATING SIGNAL STRENGTH DETECTOR

Stuart W. Thro, Cary, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 2, 1984, Ser. No. 627,270

Int. Cl.[4] H04B *17/00, 1/16*

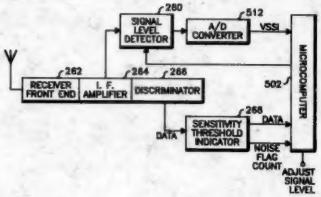
U.S. Cl. 455—226 **10 Claims**

1. A self-calibrating signal strength detector for use in an RF receiver having an output, comprising:

(a) an RF signal strength detector coupled to the output of said receiver having a relatively wide dynamic range and an adjustable output signal;

(b) a receiver sentivity threshold indicator circuit coupled to the output of said receiver circuit having a relatively narrow dynamic range, said receiver sensitivity threshold indicating circuit providing an output signal indicating when a received signal is at the receiver sensitivity threshold; and

(c) processing means coupled to each of said signal strength detector and said signal sensitivity threshold indicator



circuit for monitoring the outputs thereof and adjusting the output signal of said signal strength detector means to a predetermined value when said signal sensitivity threshold indicator indicates a received signal is at the received threshold.

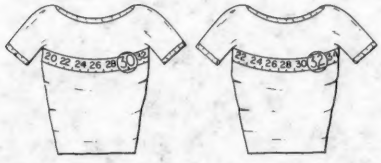
DESIGN PATENTS

GRANTED OCT. 21, 1986

ERRATA

For CLASS	See PATENT NO.
D29–015	286,222
D11–232	286,223
D11–232	286,224
D11–232	286,225
D03–104	286,226

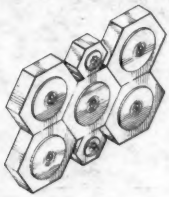
286,220
T-SHIRT
James Irwin, 1706 Fifth Ave., Arnold, Pa. 15068
Filed Jan. 13, 1984, Ser. No. 570,599
Term of patent 14 years
U.S. Cl. D2—209



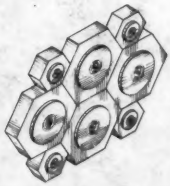
286,221
PILOT'S TRAINING VISOR
John T. Murray, II, 89 Butler Pkwy., Summit, N.J. 07901
Filed Oct. 1, 1984, Ser. No. 656,527
Term of patent 14 years
U.S. Cl. D2—514

286,222
COMBINED THERMAL HOOD AND FACE MASK FOR SCUBA DIVERS
Brian N. Talbot, 281 S. Spalding #H, Beverly Hills, Calif. 90212
Filed Jun. 18, 1984, Ser. No. 621,616
Term of patent 14 years
U.S. Cl. D29—15

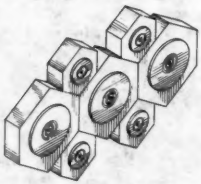
286,223
BELT BUCKLE
Jack C. Seehase, 1200 Osceola Ave., Winter Park, Fla. 32789
Filed Jul. 18, 1985, Ser. No. 756,341
Term of patent 14 years
U.S. Cl. D11—232



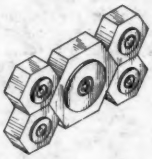
286,224
BELT BUCKLE
Jack C. Seehase, 1200 Osceola Ave., Winter Park, Fla. 32789
Filed Jul. 18, 1985, Ser. No. 756,342
Term of patent 14 years
U.S. Cl. D11—232



286,225
BELT BUCKLE
Jack C. Seehase, 1200 Osceola Ave., Winter Park, Fla. 32789
Filed Jul. 18, 1985, Ser. No. 756,343
Term of patent 14 years
U.S. Cl. D11—232

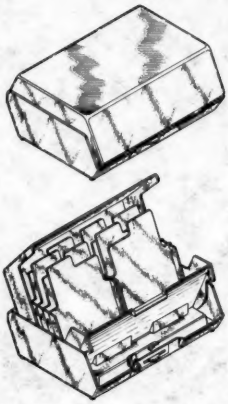


286,226
BELT BUCKLE
Jack C. Seehase, 1200 Osceola Ave., Winter Park, Fla. 32789
Filed Jul. 18, 1985, Ser. No. 756,345
Term of patent 14 years
U.S. Cl. D11—232

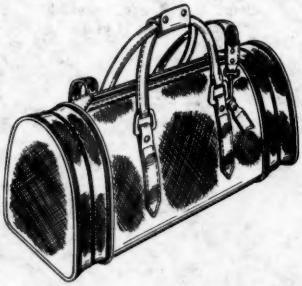


286,227
CARRIER FOR A CHILD
Gary R. Ellis, Rte. 3, Box 40A, Fulton, Mo. 65251
Continuation-in-part of Ser. No. 441,401, Nov. 15, 1982. This application Jul. 22, 1985, Ser. No. 757,359
Term of patent 14 years
U.S. Cl. D3—32

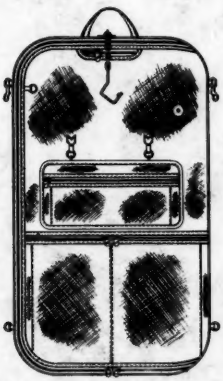
286,228
DISKETTE STORAGE CONTAINER FOR HOLDING A PLURALITY OF DISKETTES
Jerry M. Long, Pleasanton, and James A. Womack, Los Gatos, both of Calif., assignors to Innovative Concepts, Inc., San Jose, Calif.
Filed Mar. 23, 1984, Ser. No. 592,678
Term of patent 14 years
U.S. Cl. D3—35



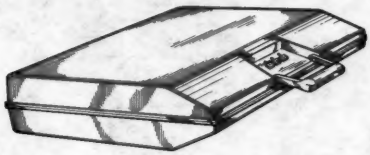
286,229
LUGGAGE CASE
Eckhard Knoepke, Norwalk, Conn., and Martin R. Feinberg, New York, N.Y., assignors to Samsonite Corporation, Denver, Colo.
Filed Mar. 19, 1984, Ser. No. 591,143
Term of patent 14 years
U.S. Cl. D3—48



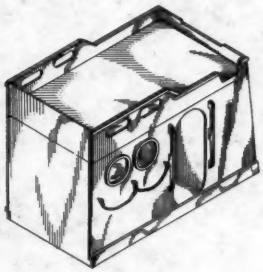
286,230
GARMENT BAG
Leonard Cohen, Valley Stream; Martin R. Feinberg, New York, both of N.Y.; Eckhard Knoepke, Norwalk, Conn., and William J. Quinlan, New York, N.Y., assignors to Samsonite Corporation, Denver, Colo.
Filed Mar. 19, 1984, Ser. No. 591,142
Term of patent 14 years
U.S. Cl. D3—71



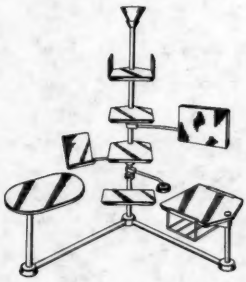
286,231
ATTACHE CASE
Otto Werk, LangÅ, Denmark, assignor to Cavalet ApS, Denmark
Filed Apr. 19, 1983, Ser. No. 486,428
Claims priority, application Denmark, Feb. 16, 1983, 163/83
Term of patent 14 years
U.S. Cl. D3—72



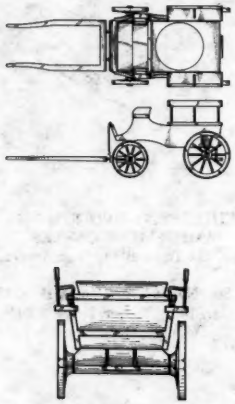
286,232
COMBINED CHILDREN'S BED, STORAGE UNIT AND AMUSEMENT CENTER
Richard E. Fisher, 194 Tudor Blvd., West Seneca, Buffalo, N.Y. 14220
Continuation of Ser. No. 867,827, Jan. 9, 1978. This application Mar. 18, 1983, Ser. No. 476,802
Term of patent 14 years
U.S. Cl. D6—384



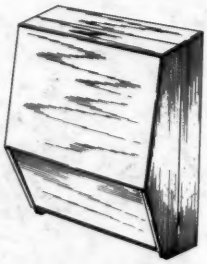
286,233
WORK STATION
Charles Schreiner, 346 Mary St., Box 711, Saugatuck, Mich. 49453
Filed Mar. 19, 1984, Ser. No. 590,898
Term of patent 14 years
U.S. Cl. D6—397



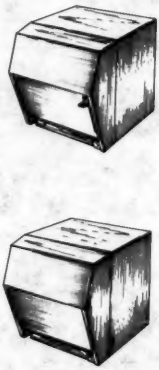
286,234
SUPPORT FOR FLOWER POTS
Gerardus F. Mens, Von Bonninghausenlaan 4, 2161 Et Lisse, Netherlands
Filed Feb. 7, 1985, Ser. No. 699,249
Claims priority, application Hague, Aug. 20, 1984, DM004109
Term of patent 14 years
U.S. Cl. D6—404



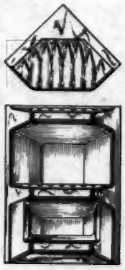
286,235
PAPER TOWEL CABINET
Scott J. Collins, Brown Deer, Wis., assignor to Wisconsin Tissue Mills, Inc., Menasha, Wis.
Filed Jul. 23, 1984, Ser. No. 633,557
Term of patent 14 years
U.S. Cl. D6—522



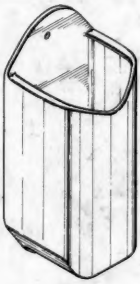
286,236
PAPER TOWEL DISPENSING CABINET
Scott J. Collins, Brown Deer, Wis., assignor to Wisconsin Tissue Mills, Inc., Menasha, Wis.
Filed Jul. 23, 1984, Ser. No. 633,556
Term of patent 14 years
U.S. Cl. D6—522



286,237
COMBINED ACCESSORY HOLDER AND GRAB BAR UNIT FOR A TUB AND SHOWER
Kenneth J. Muderlak, Del Mar, Calif., assignor to Lippert Corporation, Menomonee Falls, Wis.
Filed Aug. 22, 1984, Ser. No. 643,143
Term of patent 14 years
U.S. Cl. D6—525

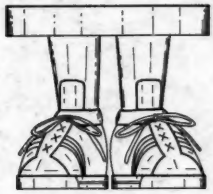


286,238
WALL MOUNTED HOLDER FOR AN ELECTRIC CURLING IRON, CURLING BRUSH OR THE LIKE
Thelma R. Burton, 5904 Hamilton Rd., Peoria, Ill. 61614
Filed Apr. 24, 1984, Ser. No. 603,339
Term of patent 14 years
U.S. Cl. D6—573



286,239
HEAD CUSHION
Robert S. Scheurer, and Stephen Scheurer, both of P.O. Box 539, Wichita Falls, Tex. 76307
Filed Dec. 20, 1984, Ser. No. 684,040
Term of patent 14 years
U.S. Cl. D6—601

286,240
NOTION TRAY
Roy E. Satterfield, 309 Oak Park Dr., Knoxville, Tenn. 37918
Filed Sep. 27, 1983, Ser. No. 536,189
The portion of the term of this patent subsequent to Feb. 7, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—5



286,241
CHAMPAGNE FLUTE
Alfred Blake, Hillsdale, N.J., and Michael Lax, New York, N.Y., assignors to American Commercial, Incorporated, Secaucus, N.J.
Filed Jun. 6, 1983, Ser. No. 501,020
The portion of the term of this patent subsequent to Oct. 21, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—11

286,242

GOBLET

Alfred Blake, Hillsdale, N.J., and Michael Lax, New York, N.Y., assignors to American Commercial, Incorporated, Secaucus, N.J.

Filed Jun. 6, 1983, Ser. No. 501,021

The portion of the term of this patent subsequent to Oct. 21, 2000, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—11

286,243

WINE GLASS

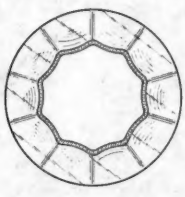
Alfred Blake, Hillsdale, N.J., and Michael Lax, New York, N.Y., assignors to American Commercial, Incorporated, Secaucus, N.J.

Filed Jun. 6, 1983, Ser. No. 501,257

The portion of the term of this patent subsequent to Oct. 21, 2000, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—11



286,244

CHAMPAGNE GLASS

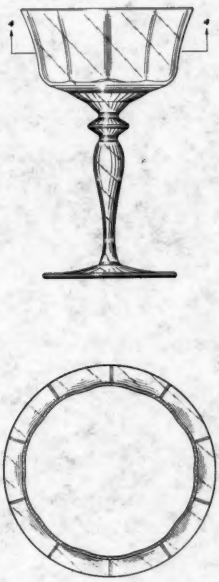
Alfred Blake, Hillsdale, N.J., and Michael Lax, New York, N.Y., assignors to American Commercial, Incorporated, Secaucus, N.J.

Filed Jun. 6, 1983, Ser. No. 501,288

The portion of the term of this patent subsequent to Oct. 21, 2000, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—11



286,245

CHAMPAGNE GLASS

Alfred Blake, Hillsdale, N.J., assignor to American Commercial, Incorporated, Secaucus, N.J.

Filed Jun. 6, 1983, Ser. No. 501,019

The portion of the term of this patent subsequent to Oct. 21, 2000, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—13

286,246

CHAMPAGNE FLUTE

Alfred Blake, Hillsdale, N.J., assignor to American Commercial, Incorporated, Secaucus, N.J.

Filed Jun. 6, 1983, Ser. No. 501,148

The portion of the term of this patent subsequent to Oct. 21, 2000, has been disclaimed.

Term of patent 14 years

U.S. Cl. D7—13

286,247

WINE GLASS

Alfred Blake, Hillsdale, N.J., assignor to American Commercial, Incorporated, Secaucus, N.J.

Filed Jun. 6, 1983, Ser. No. 501,150

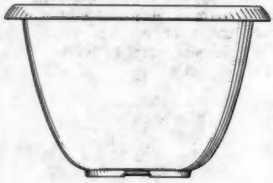
The portion of the term of this patent subsequent to Oct. 21, 2000, has been disclaimed.

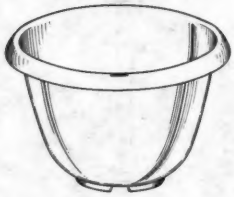
Term of patent 14 years

U.S. Cl. D7—13

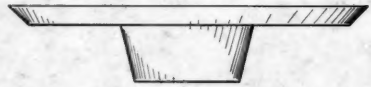
286,248
GOBLET
Alfred Blake, Hillsdale, N.J., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Jun. 6, 1983, Ser. No. 501,258
The portion of the term of this patent subsequent to Oct. 21, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—13

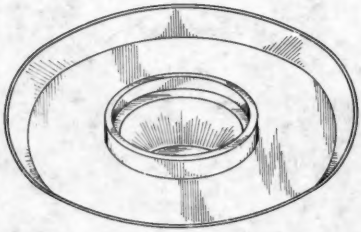
286,249
FOOD BOWL
Arthur R. Carlson, East Malvern, Australia, assignor to The Decor Corporation Proprietary Ltd., Scoresby, Australia
Filed Mar. 2, 1983, Ser. No. 471,523
Term of patent 14 years
U.S. Cl. D7—23



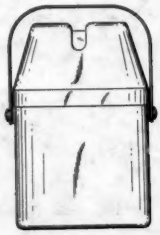


286,250
COMBINED FOOD PLATE AND BEVERAGE CONTAINER HOLDER
Earl H. Prescott, W. Los Angeles, Calif., assignor to Syl Kouby and Scarlett P. Tuttle, both of Sherman Oaks, Calif.
Filed Jun. 27, 1984, Ser. No. 625,013
Term of patent 14 years
U.S. Cl. D7—27





286,251
INSULATED CONTAINER
Izak K. Steyn, P.O. Box 973, Somerset West, 7130, Cape Province, South Africa
Filed Mar. 4, 1983, Ser. No. 472,198
Claims priority, application South Africa, Sep. 7, 1982, 82/0835
Term of patent 14 years
U.S. Cl. D7—77



286,252

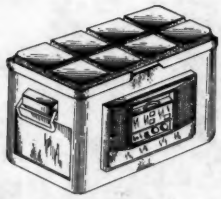
COMBINED COOLER CHEST AND RADIO

Raymond Goodwin, Shrewsbury, Mass., assignor to International Leisuretime Products, Inc., Worcester, Mass.

Filed Oct. 5, 1983, Ser. No. 539,264

Term of patent 14 years

U.S. Cl. D7—77



286,253

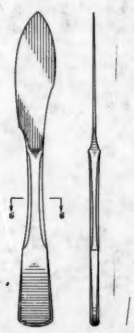
ARTICLE OF FLATWARE

Horst Schultz, Frankfurt, Fed. Rep. of Germany, assignor to AMC International ALFA Metalcraft Corporation, Fed. Rep. of Germany

Division of Ser. No. 561,634, Dec. 15, 1983. This application Dec. 4, 1985, Ser. No. 804,546

Term of patent 14 years

U.S. Cl. D7—137



286,254

VACUUM JUG

Anso Zimmerman, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederaula, Fed. Rep. of Germany

Filed May 9, 1983, Ser. No. 493,027

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1982, MR 185

Term of patent 14 years

U.S. Cl. D7—317

286,255

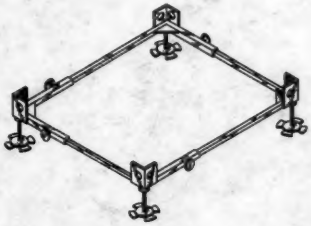
CAMP STOVE LEVELER FRAME

Eugene M. Gage, 11610 Larch St., Coon Rapids, Minn. 55433

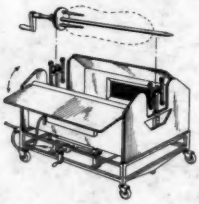
Filed Oct. 26, 1984, Ser. No. 665,143

Term of patent 14 years

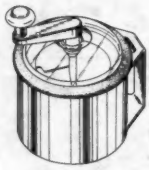
U.S. Cl. D7—332



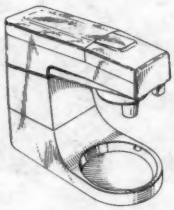
286,256
BARBECUE GRILL
Kwan S. Jung, 54-18, 1-Ka, Myong Dong, Chung-Ku, Seoul, Rep. of Korea
Filed Nov. 30, 1984, Ser. No. 676,841
Claims priority, application Rep. of Korea, May 30, 1984, 6253 ROK
Term of patent 14 years
U.S. Cl. D7—334



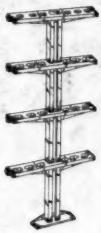
286,257
ICECREAM MAKER
Susumu Uesaka, Tokyo, Japan, assignor to Nippon Light Metal Company Limited, Tokyo, Japan
Filed Dec. 22, 1983, Ser. No. 564,214
Term of patent 14 years
U.S. Cl. D7—368



286,258
FOOD MIXER
Kenneth H. Grange, London, England, assignor to Thorn Emi Domestic Appliances Limited, London, England
Filed Dec. 15, 1983, Ser. No. 561,944
Claims priority, application United Kingdom, Aug. 20, 1983, 1014749
Term of patent 14 years
U.S. Cl. D7—379

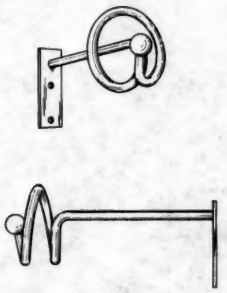


286,259
ESPALIER FRAME
Eric R. Evans, Napier, New Zealand, assignor to EBRO Espalier Limited, Napier, New Zealand
Filed Jun. 17, 1983, Ser. No. 505,475
Claims priority, application New Zealand, Jan. 6, 1983, 18179
Term of patent 14 years
U.S. Cl. D8—1



286,260
HOLDER FOR STERILIZING JAR LIDS OR SIMILAR ARTICLES
John Rankin, Milwaukie, Oreg., assignor to Nordic Products, Inc., Mountlake Terrace, Wash.
Filed May 8, 1984, Ser. No. 608,333
Term of patent 14 years
U.S. Cl. D8—14

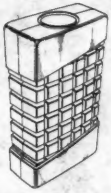
286,261
CURTAIN DRAPING HOOK
Sten A. M. Smederöd, Box 20066, S-400 50 Göteborg, Sweden
Filed Feb. 10, 1984, Ser. No. 579,128
Term of patent 14 years
U.S. Cl. D8—354



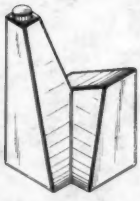
286,262
CONTAINER FOR KNITTING NEEDLES
Hidekazu Okada, Ashiya, Japan, assignor to Clover Mfg. Co., Ltd., Osaka, Japan
Filed Oct. 25, 1983, Ser. No. 545,220
Claims priority, application Japan, Aug. 18, 1983, 58-35983
Term of patent 14 years
U.S. Cl. D9—303

286,263
SIMULATIVE BOX
John R. Maschal, Beach Haven, N.J., and Judy Dreisbach, West Chester, Pa., assignors to JM[10], Beach Haven, N.J.
Filed Nov. 29, 1983, Ser. No. 556,180
Term of patent 14 years
U.S. Cl. D9—322

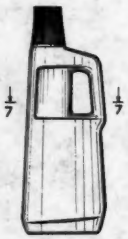
286,264
CONTAINER FOR REFRIGERANT GEL OR THE LIKE
Stanley A. Katz, Houston, Tex., assignor to Igloo Corporation, Houston, Tex.
Filed Apr. 10, 1984, Ser. No. 598,717
Term of patent 14 years
U.S. Cl. D9—367



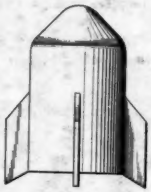
286,265
BOTTLE OR THE LIKE
Juris M. Mednis, Howell, N.J., assignor to Universal Symetrics Corporation, Howell, N.J.
Filed May 14, 1984, Ser. No. 609,988
Term of patent 14 years
U.S. Cl. D9—367



286,266
COMBINED BOTTLE AND CAP
Steen Vesborg, Gentofte, and Henrik Jacobsen, Vedbaek, both of Denmark, assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Mar. 16, 1984, Ser. No. 590,313
Claims priority, application Denmark, Sep. 2, 1983, 83.823; Sep. 2, 1983, 83.824
Term of patent 14 years
U.S. Cl. D9—376

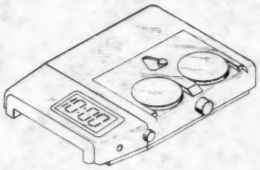


286,267
CAP FOR EXTRUSION TUBES AND THE LIKE
Bernard Schneider, Sainte Ménehould, France, assignor to Tuboplast s.a., Paris, France
Filed Jan. 3, 1984, Ser. No. 568,241
Term of patent 14 years
U.S. Cl. D9—435

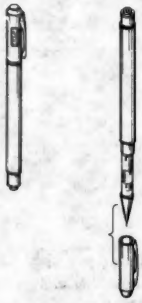


286,268
PORTION MEASURING INSERT FOR A CONTAINER OR THE LIKE
Martin J. Wolff, North Providence, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Jun. 6, 1983, Ser. No. 501,347
Term of patent 14 years
U.S. Cl. D9—447

286,269
COMBINED WRISTWATCH AND RADIO
Jiro Matsuo, Chiba, and Kaname Atsumi, Tokyo, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Jul. 5, 1984, Ser. No. 627,927
Claims priority, application Japan, Apr. 11, 1984, 59-14401
Term of patent 14 years
U.S. Cl. D10—31



286,270
COMBINED PEN, WATCH AND PRESSURE GAUGE
Tien T. Huang, No. 4, 30 Lane, Wu-Chuang Street, Pan-Chiao City, Taipei, Taiwan
Filed Aug. 5, 1983, Ser. No. 520,624
Term of patent 14 years
U.S. Cl. D10—86



286,271
INSTRUMENT HOUSING FOR A SKI POLE
Roman Buch, Box 33 St. Marys Rd., P.O. Box 686, Mettawa, Ill. 60048
Filed Feb. 21, 1984, Ser. No. 581,867
Term of patent 14 years
U.S. Cl. D10—102

286,272

LINK FOR JEWELRY CHAIN

Gianni Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy

Filed May 23, 1984, Ser. No. 613,368

Claims priority, application Italy, Dec. 21, 1983, 36.363/83[U]

Term of patent 14 years

U.S. Cl. D11—93

286,273

VASE

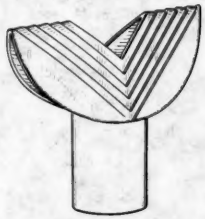
Ambrogio Pozzi, Gallarate, Italy, assignor to Rosenthal Aktiengesellschaft Rechtsabteilung, Fed. Rep. of Germany

Filed Aug. 23, 1984, Ser. No. 643,663

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1984, 7368

Term of patent 14 years

U.S. Cl. D11—143



286,274

TIRE FOR A VEHICLE WHEEL

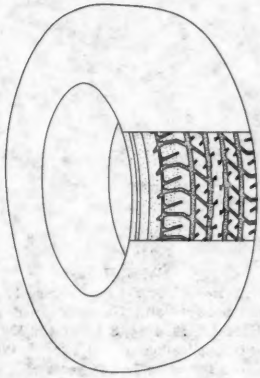
Edward P. Davis, Sutton Coldfield, and Michael J. Gallery, Cannock, both of England, assignors to Dunlop Limited, England

Filed Dec. 8, 1983, Ser. No. 559,264

Claims priority, application United Kingdom, Jun. 28, 1983, 1013789

Term of patent 14 years

U.S. Cl. D12—146



286,275

RADIATOR GRILLE FOR AN AUTOMOBILE

Mitsuo Katoh, Hachioji, and Junpei Tadano, Akishima, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 19, 1984, Ser. No. 622,280

Term of patent 14 years

U.S. Cl. D12—163

286,276

FRONT RADIATOR GRILLE FOR AN AUTOMOBILE

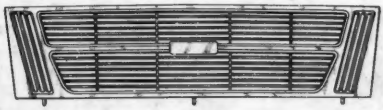
Aribert Vahlenbreder, Trollhättan, Sweden, assignor to Saab-Scania Aktiebolag, Trollhättan, Sweden

Filed Nov. 15, 1982, Ser. No. 441,553

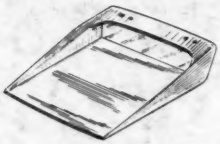
Claims priority, application Sweden, Jun. 15, 1982, 82-1567

Term of patent 14 years

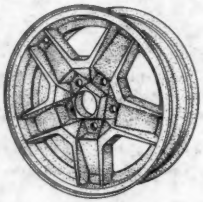
U.S. Cl. D12—163



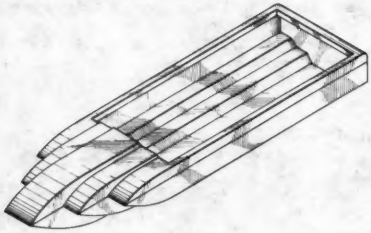
286,277
AUTOMOBILE TRUNK LID REPLACEMENT UNIT
Barry Biondo, 8 Dartmouth Rd., Cos Cob, Conn. 06807
Filed Feb. 8, 1984, Ser. No. 578,174
Term of patent 14 years
U.S. Cl. D12—196



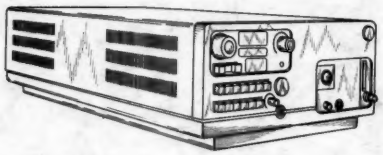
286,278
WHEEL
Ulf A. Sandberg, Box 4829, 434 00 Kungsbacka, Sweden, assignor to Aktiebolaget Volvo, Goteborg, Sweden
Filed Jul. 19, 1984, Ser. No. 632,338
Claims priority, application Sweden, Mar. 5, 1984, 84-0736
Term of patent 14 years
U.S. Cl. D12—211



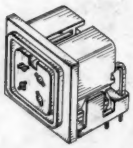
286,279
BOAT HULL AND DECK
Robert R. Maher, 521 B Matheson, Healdsburg, Calif. 95448
Filed Feb. 13, 1984, Ser. No. 579,509
Term of patent 14 years
U.S. Cl. D12—313



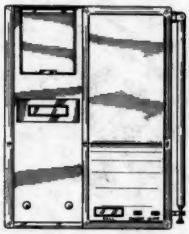
286,280
HOUSING FOR CONNECTING A MEDICAL ARGON LASER TO A LASER PROBE
Steve H. Holtman, Salt Lake City, and George A. Nelson, Sandy, both of Utah, assignors to HGM, Inc., Salt Lake City, Utah
Filed Sep. 14, 1983, Ser. No. 532,015
Term of patent 14 years
U.S. Cl. D13—19



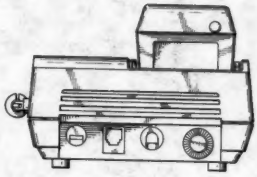
286,281
ELECTRICAL CONNECTING SOCKET
Shigemi Sekiguchi, Gunma, Japan, assignor to Hosiden Electronics Co., Ltd, Japan
Filed Aug. 30, 1984, Ser. No. 645,646
Claims priority, application Japan, Mar. 21, 1984, 59-11008
Term of patent 14 years
U.S. Cl. D13—24

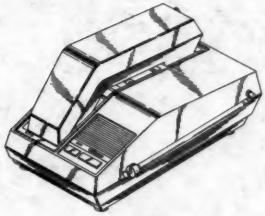


286,282
CORDLESS COMBINATION HANDSET AND STAND TELEPHONE SET
James T. Asaki, Raleigh, N.C., assignor to ITT Corporation, New York, N.Y.
Filed Jan. 30, 1984, Ser. No. 575,372
Term of patent 14 years
U.S. Cl. D14—53

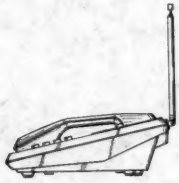


286,283
CORDLESS TELEPHONE ASSEMBLY
Stephen A. Nichols, Indianapolis, Ind., assignor to Uniden Corporation of America, Indianapolis, Ind.
Filed Mar. 9, 1983, Ser. No. 473,458
Term of patent 14 years
U.S. Cl. D14—53





286,284
TELEPHONE SET
Yoshio Sasaki; Toshio Nishimura, and Kei Matsuda, all of Kawasaki, Japan, assignors to Nitsuko Limited, Kanagawa, Japan
Filed Oct. 15, 1984, Ser. No. 660,882
Claims priority, application Japan, Jun. 29, 1984, 59-26565
Term of patent 14 years
U.S. Cl. D14—53



286,285

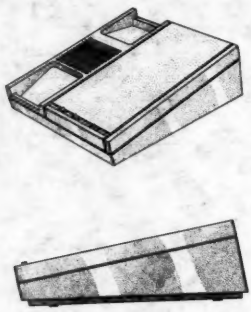
TELEPHONE STAND

David C. Danielson, New Canaan, Conn., and John N. McGarvey, Drexel Hill, Pa., assignors to AT&T Information Systems Inc., Morristown, N.J.

Filed Jan. 6, 1986, Ser. No. 816,493

Term of patent 14 years

U.S. Cl. D14—60



286,286

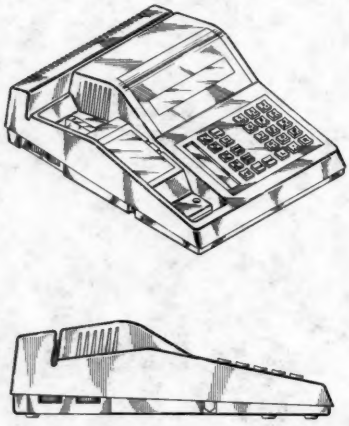
TELEPHONE STAND

Jeffrey A. Skigen, Vienna; James C. P. Lum, Herndon, both of Va., and C. Thomas Taylor, Leawood, Kans., assignors to GTE Telenet Communications Corporation, Reston, Va.

Filed Nov. 30, 1984, Ser. No. 677,007

Term of patent 14 years

U.S. Cl. D14—62



286,287

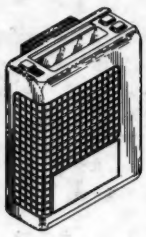
RADIO PAGER OR SIMILAR ARTICLE

Richard J. Toth, Boca Raton, and George J. Selinko, Light House Point, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 11, 1984, Ser. No. 619,084

Term of patent 14 years

U.S. Cl. D14—68



286,288

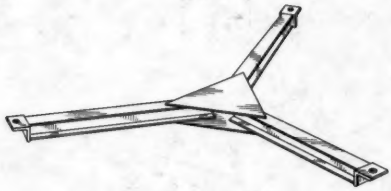
SATELLITE ANTENNA MOUNTING BASE

Jerald P. Skinner, 3014 Eveningside Dr., Topeka, Kans. 66614; Richard A. Zlotky, 246 Yorkshire, Topeka, Kans. 66606, and Robert L. Diel, 2537 Michigan, Topeka, Kans. 66605

Filed Mar. 1, 1984, Ser. No. 585,158

Term of patent 14 years

U.S. Cl. D14—91



286,289

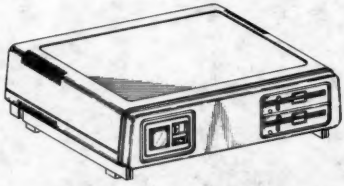
COMPUTER HOUSING

David A. Barr, Arlington, and Bernard A. Grae, Fort Worth, both of Tex., assignors to Tandy Corporation, Fort Worth, Tex.

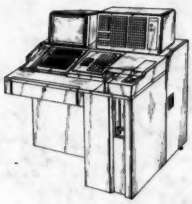
Filed Nov. 29, 1983, Ser. No. 556,207

Term of patent 14 years

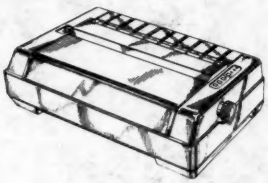
U.S. Cl. D14—100



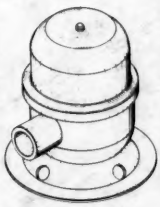
286,290
SEASON TICKET ISSUING MACHINE
Yoshiaki Nishida, Omorinishi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Jul. 1, 1983, Ser. No. 510,248
Claims priority, application Japan, Jan. 6, 1983, 37/83
Term of patent 14 years
U.S. Cl. D14—104



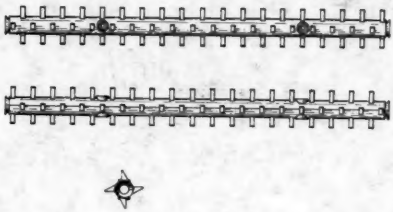
286,291
PRINTER
Nobufusa Kuroki, Machida, Japan, assignor to Janome Sewing Machine Co., Ltd., Kyobashi, Japan
Filed Jan. 17, 1984, Ser. No. 571,520
Claims priority, application Japan, Sep. 8, 1983, 58-38887
Term of patent 14 years
U.S. Cl. D14—111



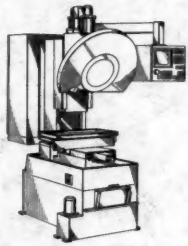
286,292
AIR COMPRESSOR FOR TUBS AND THE LIKE
James E. Kingston, Arlington, Wash., assignor to Hollibaugh Manufacturing Company, Inc., Marysville, Wash.
Filed Feb. 28, 1983, Ser. No. 470,818
Term of patent 14 years
U.S. Cl. D15—9



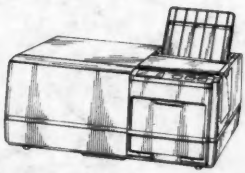
286,293
DESIGN FOR SPREADER AGITATOR
Robert A. Germain, Anderson, S.C., assignor to USM Corporation, Farmington, Conn.
Filed Feb. 29, 1984, Ser. No. 584,583
Term of patent 14 years
U.S. Cl. D15—28



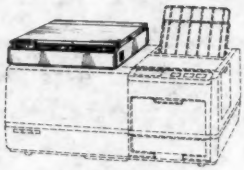
286,294
MACHINE USED FOR DRILLING, TAPPING AND MILLING, AND HAVING AN AUTOMATIC TOOL CHANGING SYSTEM
Kazuo Itoh, Aichi, Japan, assignor to brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Aug. 27, 1984, Ser. No. 644,538
Claims priority, application Japan, Feb. 29, 1984, 59-7699
Term of patent 14 years
U.S. Cl. D15—132



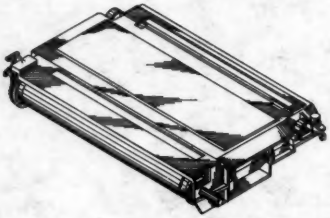
286,295
ELECTRONIC COPYING MACHINE
Kunio Hara, Chiba, and Tooru Okuyama, Isehara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan
Filed Apr. 19, 1984, Ser. No. 602,128
Claims priority, application Japan, Oct. 19, 1983, 58-45036
Term of patent 14 years
U.S. Cl. D16—31



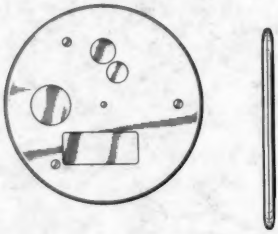
286,296
SCANNER FOR ELECTRONIC COPYING MACHINE
Kunio Hara, Chiba, and Tooru Okuyama, Isehara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan
Filed Apr. 19, 1984, Ser. No. 602,129
Claims priority, application Japan, Oct. 19, 1983, 58-45037
Term of patent 14 years
U.S. Cl. D16—32



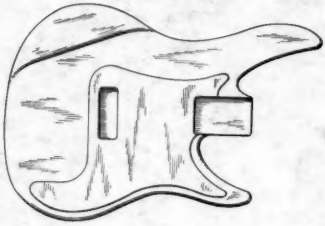
286,297
OFFICE COPIER PROCESSING CARTRIDGE
Robert A. Clowe, Penfield, N.Y., and Robert L. Gault, Raleigh, N.C., assignors to Xerox Corporation, Stamford, Conn.
Filed May 25, 1984, Ser. No. 614,217
Term of patent 14 years
U.S. Cl. D16—32



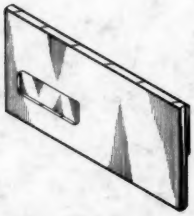
286,298
INTEGRATING PHOTOMETER
Joe T. May, Leesburg, and Steven D. Hale, Lovettsville, both of Va., assignors to Colight, Inc., Minneapolis, Minn. and Electronic Instrumentation & Technology, Sterling, Va.
Filed Feb. 3, 1984, Ser. No. 576,753
Term of patent 14 years
U.S. Cl. D16—39



286,299
GUITAR BODY OR SIMILAR ARTICLE
Hartley D. Peavey, Meridian, Miss., assignor to Peavey Electronics Corp., Meridian, Miss.
Filed Mar. 2, 1984, Ser. No. 585,871
Term of patent 14 years
U.S. Cl. D17—20

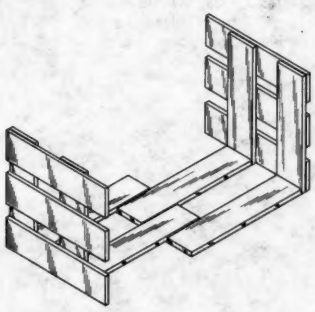


286,300
MAILING ENVELOPE
Bruce E. Bourgeois, 807 Arlington Cr., Richmond, Va. 23229
Filed Jan. 19, 1984, Ser. No. 572,011
Term of patent 14 years
U.S. Cl. D19—3

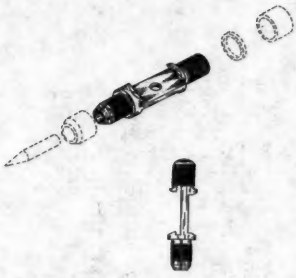


286,301
LONG STEM VALENTINE CARD
Virginia K. Fain, 1933 Lamont St., Kingsport, Tenn. 37664
Filed Jan. 6, 1984, Ser. No. 568,816
Term of patent 14 years
U.S. Cl. D19—6

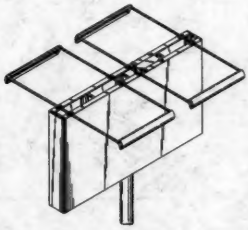
286,302
ADJUSTABLE LIBRARY SHELF
Jenneye L. Shugar, 8818 Croes Dr., Houston, Tex. 77055
Filed Feb. 15, 1984, Ser. No. 580,561
Term of patent 14 years
U.S. Cl. D19—34.1



286,303
TRAMMEL HEAD
Hong K. Park, 300 Harolds Dr., Huntsville, Ala. 35806
Filed Mar. 26, 1984, Ser. No. 593,588
Term of patent 14 years
U.S. Cl. D19—99



286,304
OUTDOOR ADVERTISING SIGN
Peter Wiens, 2225 Pine Street, Prince George, British Columbia, Canada
Filed Aug. 2, 1984, Ser. No. 637,117
Claims priority, application Canada, Feb. 8, 1984, 08-02-84-7
Term of patent 14 years
U.S. Cl. D20—39



286,305

GAME BOARD

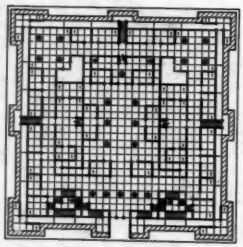
Harold B. Leggett, P.O. Box 134, Alliston, Ontario, Canada (L0M 1A0)

Filed Jan. 20, 1984, Ser. No. 572,297

Claims priority, application Canada, Jul. 26, 1983, 26/07/83/6

Term of patent 14 years

U.S. Cl. D21—25



286,306

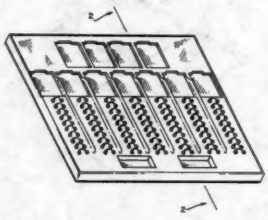
SOLITAIRE GAME BOARD

James J. Colomac, Jr., 2855 Marine St. #4, Boulder, Colo. 80302

Filed May 11, 1984, Ser. No. 609,465

Term of patent 14 years

U.S. Cl. D21—57



286,307

PLAYHOUSE

Joseph C. Roy, Columbia, S.C., assignor to J. C. Roy Company, Inc., Columbia, S.C.

Filed Jul. 3, 1984, Ser. No. 627,966

Term of patent 14 years

U.S. Cl. D21—114

286,308

COMBINED TOY GUN AND CARRYING CASE

John F. Mayer, Fort Thomas, Ky., and John J. Norton, Cincinnati, Ohio, assignors to CPG Products Corp., Minneapolis, Minn.

Filed Jul. 2, 1984, Ser. No. 627,362

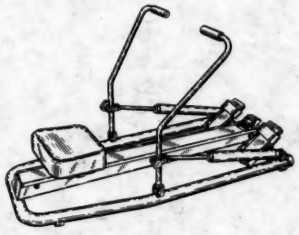
Term of patent 14 years

U.S. Cl. D21—146

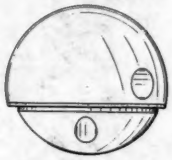
286,309
CLOWN DOLL IN A SWING OR THE LIKE
Frank Volney, Jr., 715 De Graffenreid Ave., New Bern, N.C. 28560
Filed Apr. 16, 1984, Ser. No. 600,946
Term of patent 14 years
U.S. Cl. D21—173

286,310
DOLL
Joretta Rupp, 2801 Rexing Rd., Wadesville, Ind. 47638, and Vera E. Emmons, Rte. 1, Box 412, Dale, Ind. 47523
Filed Jul. 6, 1984, Ser. No. 628,623
Term of patent 14 years
U.S. Cl. D21—175

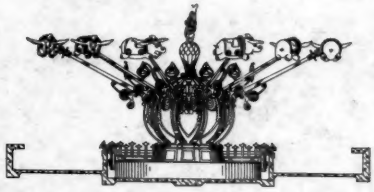
286,311
ROWING MACHINE
William J. Martinell, and Steven W. Martinell, both of Vancouver, Wash., assignors to Pro Form, Inc., Beaverton, Oreg.
Filed May 25, 1984, Ser. No. 614,159
Term of patent 14 years
U.S. Cl. D21—195



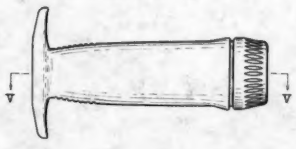
286,312
GRIP EXERCISER
Kiyohiko Tsuzuki, Sakaki, Japan, assignor to Kabushiki Kaisha Tsuzuki Seisakujo, Sakaki, Japan
Filed Feb. 16, 1984, Ser. No. 580,953
Claims priority, application Japan, Jan. 21, 1983, 58-8943
Term of patent 14 years
U.S. Cl. D21—198



286,313
AMUSEMENT RIDE
Robert J. Kurzweil, Van Nuys, Calif., assignor to Walt Disney Productions, Burbank, Calif.
Filed Aug. 26, 1983, Ser. No. 526,622
Term of patent 14 years
U.S. Cl. D21—249



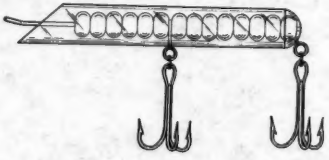
286,314
KNIFE HANDLE
Minoru Sawa, Seki, Japan, assignor to Kinryu Cutlery Mfg. Co., Ltd., Seiki, Japan
Filed Apr. 16, 1984, Ser. No. 601,042
Term of patent 14 years
U.S. Cl. D22—118



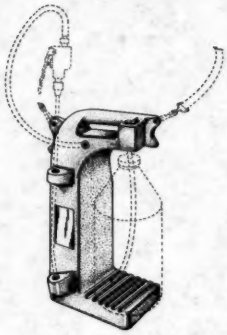
286,315
AMMUNITION MAGAZINE POUCH
Wayne R. Gregory, San Diego, Calif., assignor to Bianchi International, Temecula, Calif.
Filed Jan. 30, 1984, Ser. No. 575,307
Term of patent 14 years
U.S. Cl. D3—104

286,316
FISHING BAIT
Crafton R. Penalber, Rte. 2, Box 299-B, Baker, La. 70714, assignor to Crafton L. Penalber, Wellington, Kans.
Filed Sep. 21, 1983, Ser. No. 534,334
Term of patent 14 years
U.S. Cl. D22—129

286,317
FLUORESCENT LURE
Lance Orlick, 60 Hope Ave., and Kenneth Parlatore, 1320 Bay St., both of Staten Island, N.Y. 10305
Filed Nov. 10, 1983, Ser. No. 550,912
Term of patent 14 years
U.S. Cl. D22—127

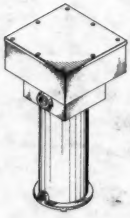


286,318
SPRAYER
Ray Passien, Rte. 3, Box 291, Klamath Falls, Oreg. 97601
Filed Nov. 18, 1983, Ser. No. 553,531
Term of patent 14 years
U.S. Cl. D23—18

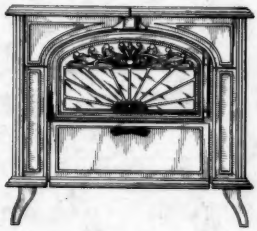


286,319
GUARD FOR A WATER SUCTION PIPE
Cleo D. Mathis, 1808 Potrero Ave., South El Monte, Calif. 91733
Filed Jul. 11, 1983, Ser. No. 512,594
Term of patent 14 years
U.S. Cl. D23—41

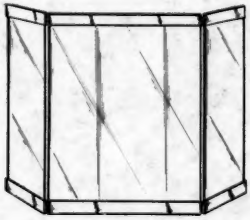
286,320
WATER HEATER FOR TUBS, SWIMMING POOLS AND THE LIKE
James E. Kingston, Arlington, Wash., assignor to Hollibaugh Manufacturing Company, Inc., Marysville, Wash.
Filed Feb. 28, 1983, Ser. No. 470,829
Term of patent 14 years
U.S. Cl. D23—88



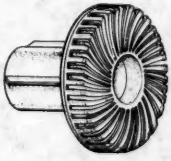
286,321
WOOD BURNING STOVE
Benoit Catry, Bondues, France, assignor to Fonderies Franco-Belges, Merville, France
Filed Aug. 27, 1984, Ser. No. 644,336
Claims priority, application Hague, Feb. 27, 1984, DM 003 469
Term of patent 14 years
U.S. Cl. D23—97



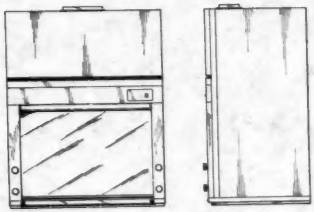
286,322
FIREPLACE SCREEN
Joseph J. Catania, Cheshire; Angelo Gaudino, Wallingford; Russell DeTuzzi, Huntington, and Maxwell Gardner, Wallingford, all of Conn., assignors to Century Fireplace Furnishings, Inc., Wallingford, Conn.
Filed Jun. 29, 1984, Ser. No. 626,436
Term of patent 14 years
U.S. Cl. D23—138.3



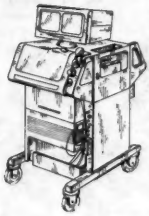
286,323
AIR FRESHENER DISPENSER
Brian D. Haworth, Farnborough, England, assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Oct. 3, 1983, Ser. No. 538,242
Term of patent 14 years
U.S. Cl. D23—150



286,324
LABORATORY FUME HOOD
James D. Parks, Johnson County, Kans.; Charles A. Moss, Jackson County, Mo.; Kermit W. Dyer, and James F. Corn, both of Johnson County, Kans., assignors to Labconco Corporation, Kansas City, Mo.
Filed Jun. 27, 1983, Ser. No. 507,762
Term of patent 14 years
U.S. Cl. D23—151

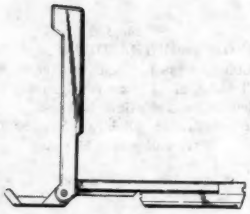


286,325
MEDICAL ULTRASOUND SCANNER
LeRoy J. LaCelle; Joseph L. Ungar, both of Redmond, and Gary J. Selke, Kirkland, all of Wash., assignors to Advanced Technology Laboratories, Inc., Bothell, Wash.
Filed Nov. 25, 1983, Ser. No. 555,237
Term of patent 14 years
U.S. Cl. D24—1.1



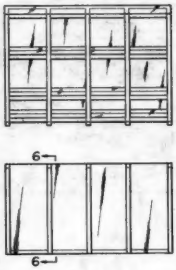
286,326
TONGUE CLEANER OR SIMILAR ARTICLE
Anil S. Gautam, 261 Hill Ave., Glen Ellyn, Ill. 60137
Filed Jun. 14, 1984, Ser. No. 620,730
Term of patent 14 years
U.S. Cl. D24—28

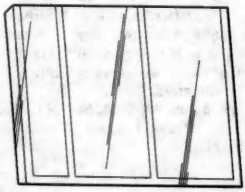
286,327
RAZOR
Hans Halm, Herne, Fed. Rep. of Germany, assignor to Wilkinson Sword Limited, High Wycombe, England
Filed Jun. 1, 1984, Ser. No. 616,369
Claims priority, application United Kingdom, Dec. 2, 1983, 1 016 666
Term of patent 14 years
U.S. Cl. D28—45



286,328
ELECTRIC DRY SHAVER
Roland Ullmann, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany
Filed Sep. 21, 1984, Ser. No. 652,925
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1984, 73NR9269
Term of patent 14 years
U.S. Cl. D28—49

286,329
COMPARTMENTED TRAY FOR COSMETIC ORGANIZER OR THE LIKE
Howard Sussman, 3101 NW. 25th St., Pompano Beach, Fla. 33060
Filed Sep. 26, 1983, Ser. No. 535,430
Term of patent 14 years
U.S. Cl. D28—73



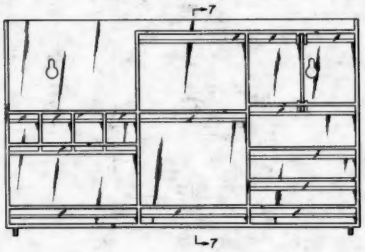


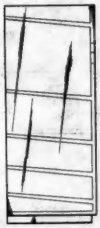
286,330

SHELF UNIT FOR TOILETRIES OR THE LIKE

Howard Sussman, 3101 NW. 25th St., Pompano Beach, Fla. 33060

Filed Sep. 26, 1983, Ser. No. 535,731
Term of patent 14 years
U.S. Cl. D28—73





286,331

PERSONAL CARE COMPACT

Dominic L. Scoccola, Cleveland, Ohio, assignor to S.A.S. Ventures, Inc., Cleveland, Ohio

Filed Oct. 3, 1984, Ser. No. 657,155
Term of patent 14 years
U.S. Cl. D28—78

286,332

COMBINED HOG TROUGH FEEDER AND DIVIDER

Peter Christianson, Box 2005, Elbow Lake, Minn. 56531

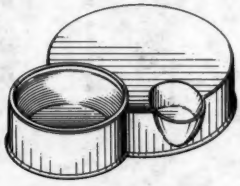
Filed Dec. 17, 1984, Ser. No. 682,687
Term of patent 14 years
U.S. Cl. D30—13

286,333

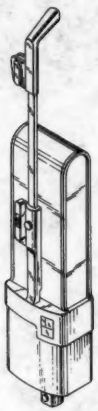
COMBINATION FOOD AND WATER PET FEEDER

Arthur L. Fassauer, 420 Foster La., Canyon, Tex. 79015

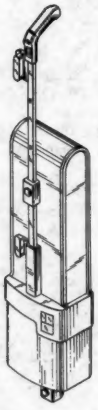
Filed Sep. 13, 1984, Ser. No. 650,766
Term of patent 14 years
U.S. Cl. D30—16



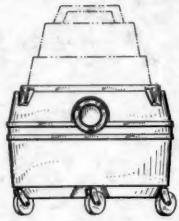
286,334
VACUUM CLEANER
Rolf Strohmeyer, Wuppertal, Fed. Rep. of Germany, assignor to Vorwerk & Co. Elektrowerke KG, Wuppertal, Fed. Rep. of Germany
Filed Jul. 25, 1983, Ser. No. 517,357
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 54 MR 14 754
The portion of the term of this patent subsequent to Oct. 21, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—22

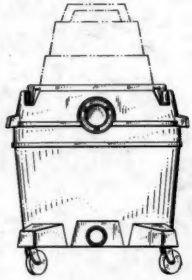


286,335
VACUUM CLEANER
Rolf Strohmeyer, Wuppertal, Fed. Rep. of Germany, assignor to Vorwerk & Co. Elektrowerke KG, Wuppertal, Fed. Rep. of Germany
Filed Jul. 25, 1983, Ser. No. 517,359
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1983, 54 MR 14 736
Term of patent 14 years
U.S. Cl. D32—22

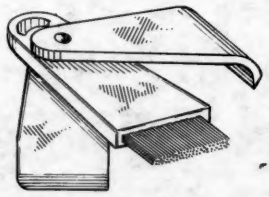


286,336
TANK FOR ELECTRIC VACUUM CLEANER
Robert C. Berfield, Jersey Shore, and Robert L. Crevling, Jr., Williamsport, both of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.
Filed Feb. 15, 1984, Ser. No. 580,559
Term of patent 14 years
U.S. Cl. D32—23





286,337
SNOW SKI CLEANING TOOL
Frank A. Wilkie, Jr., 4407 Guildhall Ct., Westlake Village, Calif. 91360
Filed Jul. 23, 1984, Ser. No. 633,639
Term of patent 14 years
U.S. Cl. D32—47



286,338

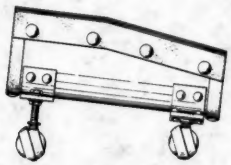
ARM SUPPORT FOR HAND TOOL

William T. Cunningham, P.O. Box 182, Butler, Mo. 64730

Filed Dec. 7, 1983, Ser. No. 558,802

Term of patent 14 years

U.S. Cl. D34—23



286,339

FOLDABLE TOTE BOX

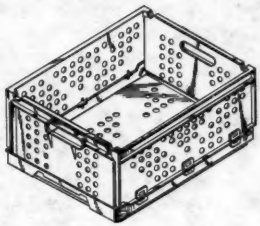
Joost van Berne, Dongen, and Gerardus J. van der Vlies, Heusden, both of Netherlands, assignors to Curver B.V., Rijen, Netherlands

Filed Aug. 9, 1983, Ser. No. 521,627

Claims priority, application Benelux, Feb. 11, 1983, 57576-00

Term of patent 14 years

U.S. Cl. D34—43



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF OCTOBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. J. Antunes & Co.: *See—*
Miller, Dye O.; Antunes, August J.; Antunes, Jerome; and Godsen, Ronald, 4,617,908, Cl. 126-20.000.

A-Lok Products, Incorporated: *See—*
Ditcher, Jack, 4,618,464, Cl. 264-35.000.

A. Nattermann & Cie GmbH: *See—*
Dereu, Norbert; Welter, Andre ; Wendel, Albrecht; Leyck, Sigurd; Parnham, Michael; Graf, Erich; Sies, Helmut; Betzing, Hans; and Fischer, Hartmut, 4,618,669, Cl. 530-331.000.

Abbott Laboratories: *See—*
DeBernardis, John F.; Kerkman, Daniel J.; and McClellan, William J., 4,618,683, Cl. 548-420.000.

Abe, Akira, to Tomy Kogyo Co. Inc. Toy amusement device. 4,618,330, Cl. 446-236.000.

Abe, Masahiro: *See—*
Aoyama, Masaharu; Abe, Masahiro; Ajima, Takashi; and Yonezawa, Toshio, 4,618,878, Cl. 357-71.000.

Abe, Mitsuo: *See—*
Miyatake, Satoshi; Abe, Mitsuo; and Kume, Masao, 4,617,761, Cl. 51-95.0GH.

Abe, Ryozo; and Sakurai, Masaki, to Victor Company of Japan, Ltd. Address data accessing device in a rotary recording medium reproducing apparatus. 4,618,950, Cl. 369-32.000.

Abe, Tadashi: *See—*
Sada, Masao; Kato, Michio; Ayano, Masami; Abe, Tadashi; and Moriwaki, Masanori, 4,618,709, Cl. 562-532.000.

Abe, Yoshiaki: *See—*
Miura, Haruo; Nagaoka, Takashi; Abe, Yoshiaki; and Sakata, Souji, 4,618,311, Cl. 415-149.00R.

Abel, Thomas E. System and choke valve actuator mechanism for operating a plunger lift well. 4,617,992, Cl. 166-95.000.

Abthoff, Jorg; Schuster, Hans-Dieter; Loose, Gunter; and Ebinger, Gunther, to Daimler-Benz Aktiengesellschaft. Exhaust gas pipe for internal-combustion engines having a receiving opening for a heated probe for determining the oxygen content of the exhaust gases. 4,617,795, Cl. 60-276.000.

Aburada, Masaki: *See—*
Okuda, Hiromichi; Masuno, Hiroshi; Aburada, Masaki; Takeda, Shigefumi; Itoh, Eiko; Matsushita, Moe; and Hosoya, Eikichi, 4,618,495, Cl. 424-195.100.

AccuSwing, Incorporated: *See—*
Hurd, Bruce; and Oda, Robert, 4,618,147, Cl. 273-54.00B.

ACF Industries, Incorporated: *See—*
Dugge, Richard H.; and Holt, Jan D., 4,618,295, Cl. 406-138.000.

Ackermann, Peter; Gsell, Laurenz; and Kohler, Boris, to Ciba-Geigy Corporation. Certain 6-phenoxy-2-pyridinyl-α-methyl-methylene esters of α-cyclopropyl-α-phenyl-acetic acid derivatives and their use for controlling pests. 4,618,615, Cl. 514-338.000.

Adachi, Hiroo, to Pioneer Electronic Corporation. Variable characteristics amplifier circuit. 4,618,834, Cl. 330-284.000.

Adams, William C.; and Taylor, William J., to Atlanta Cutlery Corporation. Weapon concealment and locking means. 4,617,951, Cl. 135-66.000.

Adler, Rafael. Solar heater. 4,617,911, Cl. 126-438.000.

Advanced Input Devices, Inc.: *See—*
Pope, Kent M.; and Hardesty, Bryan L., 4,618,744, Cl. 200-5.00A.

Advanced Micro Devices, Inc.: *See—*
Forouhi, Abdul R.; and Allen, Bert L., 4,618,541, Cl. 428-688.000.
Young, Mark S.; Drew, John; Shebanow, Michael C.; and Dujari, Vineet, 4,618,898, Cl. 360-51.000.

Agapiou, Agapios K.; Muhle, Michael E.; and Kurtzman, Myron B., to Exxon Chemical Patents Inc. Polymerization catalyst, production and use. 4,618,596, Cl. 502-116.000.

Agfa-Gevaert N.V.: *See—*
Boeve, Gerard J.; and Vierveijzer, Franciscus, 4,618,137, Cl. 271-219.000.

AGIP Petroli S.p.A.: *See—*
Brandi, Gabriella; Koch, Paolo; Maiorana, Stefano; Dalla Croce, Piero; and Baldoli, Clara, 4,618,439, Cl. 252-47.500.

Agodoa, Michael K., to SWS Silicones Corporation. Process for bonding heat curable silicone rubber to a substrate using an aqueous primer composition. 4,618,389, Cl. 156-307.500.

Ahlstone, Arthur G., to Shell Offshore Inc. Buoyant ring gasket installation tool. 4,618,285, Cl. 405-191.000.

Ahnert, Wolfgang: *See—*
Steinke, Gerhard; Fels, Peter; Hoeg, Wolfgang; Lorenz, Werner; Ahnert, Wolfgang; Steffen, Frank; and Reichardt, Walter, 4,618,987, Cl. 381-82.000.

Aihara, Kenichi: *See—*
Araki, Kazuhiko; Ao, Hideki; Inui, Jun; and Aihara, Kenichi, 4,618,607, Cl. 514-212.000.

Aipperspach, Anthony G.; Fitzgerald, Joseph M.; and Wu, Philip T., to International Business Machines Corporation. Semiconductor static read/write memory having an additional read-only capability. 4,618,943, Cl. 365-104.000.

Air Products and Chemicals, Inc.: *See—*
Ford, Michael E.; and Johnson, Thomas A., 4,618,716, Cl. 564-469.000.
Marten, Finn L., 4,618,648, Cl. 525-60.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Fujikawa, Motoi; and Kagata, Tooru, 4,618,044, Cl. 192-54.000.
Kobayashi, Kiyonori, 4,618,048, Cl. 192-106.200.
Nishimura, Takumi; and Saito, Tadao, 4,618,188, Cl. 303-116.000.
Ogasawara, Tsunehiko; Arakawa, Yoshichika; Sumiya, Koji; and Sakaguchi, Yoshikazu, 4,618,038, Cl. 192-3.290.

Aisin Warner Kabushiki Kaisha: *See—*
Ogasawara, Tsunehiko; Arakawa, Yoshichika; Sumiya, Koji; and Sakaguchi, Yoshikazu, 4,618,038, Cl. 192-3.290.

Ajemian, Van R. Raised pavement marker brace. 4,618,281, Cl. 404-16.000.

Ajima, Takashi: *See—*
Aoyama, Masaharu; Abe, Masahiro; Ajima, Takashi; and Yonezawa, Toshio, 4,618,878, Cl. 357-71.000.

Ajinomoto Co., Inc.: *See—*
Ozawa, Yoichi; Kishimoto, Shinichi; Shinohara, Emiko; Takemoto, Tadashi; and Eguchi, Chikahiko, 4,618,695, Cl. 560-41.000.
Shiio, Isamu; Sugimoto, Shinichi; and Kawamura, Kazue, 4,618,580, Cl. 435-108.000.

Akashi, Akira; Ishizaki, Akira; Hiramatsu, Akira; Suda, Yasuo; and Ohtaka, Keiji, to Canon Kabushiki Kaisha. Focus detecting apparatus. 4,618,236, Cl. 354-406.000.

Akita, Shigeyuki: *See—*
Sakakibara, Hiroyuki; Akita, Shigeyuki; Kodera, Masao; and Maeno, Tsuyoshi, 4,618,948, Cl. 367-104.000.

Akred, Brian J.: *See—*
Haslop, William P.; Allonby, John M.; Akred, Brian J.; and Messenger, Edward T., 4,618,446, Cl. 252-135.000.

Akron City Hospital: *See—*
Miller, Joseph M.; Fannin, Stephen W.; and Steiner, Paul R., 4,618,929, Cl. 364-415.000.

Aktiebolaget IRO: *See—*
Hellstroem, Jerker, 4,617,971, Cl. 139-370.200.

Alanis, J. Jesus, to Alopex Industries, Inc. Filter bag for pool cleaners. 4,618,420, Cl. 210-169.000.

Albert-Frankenthal AG: *See—*
Niedermaier, Arnold; and Maier, Peter, 4,617,864, Cl. 101-219.000.

Albert, Karl-Heinz: *See—*
Gilch, Heinz; von Voithenberg, Hubertus; and Albert, Karl-Heinz, 4,618,651, Cl. 525-130.000.

Albright & Wilson Limited: *See—*
Haslop, William P.; Allonby, John M.; Akred, Brian J.; and Messenger, Edward T., 4,618,446, Cl. 252-135.000.

Alcorn, George E.; and Burgess, Andre S., to United States of America, National Aeronautics and Space Administration. Method of fabricating an imaging X-ray spectrometer. 4,618,380, Cl. 148-187.000.

Alfranca, Jose-Maria P. Surgical instrument for practicing mechanical sutures and biopsies. 4,617,928, Cl. 128-305.000.

Ali, Frank F. Sanding, buffing and polishing tool and parts thereof. 4,617,767, Cl. 51-358.000.

Alker, David; Campbell, Simon F.; and Cross, Peter E., to Pfizer Inc. Anti-ischaemic and antihypertensive 2-[pyrimidyloxy alhoxymethyl]-1,4-dihydropyridines. 4,618,609, Cl. 514-236.000.

Allaire, Michael J.: *See—*
Cartmell, James V.; Allaire, Michael J.; and Wolf, Michael L., 4,617,935, Cl. 128-641.000.

Allaire, Paul B.; and Stashko, Daniel R., to GTE Valeron Corporation. Cutting tool and insert therefor. 4,618,296, Cl. 407-42.000.

Allais, Jean-Philippe P. B.; and Tremouilles, Francis J. M. G., to Hispano-Suiza. Military equipment comprising a turret having a main external weapon. 4,617,852, Cl. 89-36.130.

Allen, Bert L.: *See—*
Forouhi, Abdul R.; and Allen, Bert L., 4,618,541, Cl. 428-688.000.

Allen, Charles A.; and Durrett, Van D., to Allen, Charles A. Torsional vibration isolator and method. 4,617,884, Cl. 123-192.00R.

Allied Corporation: *See—*
Antonazzi, Frank J., 4,618,856, Cl. 340-626.000.
Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; Oltmann, Harold D.; and Chen, Shu P., 4,618,528, Cl. 428-216.000.
Seelig, Stanley S., 4,618,447, Cl. 252-139.000.
Vincent, Jacques, 4,618,071, Cl. 220-371.000.

Allison, George M., III, to Phillips Petroleum Company. Drilling fluids and thinners therefor. 4,618,433, Cl. 252-8.514.

Allonby, John M.: *See—*
Haslop, William P.; Allonby, John M.; Akred, Brian J.; and Messenger, Edward T., 4,618,446, Cl. 252-135.000.

Alopex Industries, Inc.: *See*—
Alanis, J. Jesus, 4,618,420, Cl. 210-169.000.
Alpa Electric Co., Ltd.: *See*—
Kuriyama, Toshihiro, 4,618,902, Cl. 360-118.000.
Okita, Masao; and Sakai, Satoshi, 4,618,951, Cl. 369-270.000.
Saito, Yukio, 4,618,900, Cl. 360-97.000.
Alt, Gerhard H.; Chupp, John P.; and Clizbe, Lane A., to Monsanto Company. Novel alkenyl acetamides and their use in the regulation of the natural growth or development of turf grass. 4,618,357, Cl. 71-76.000.
Aluminum Company of America: *See*—
Tsai, Mei-Yuan, 4,618,441, Cl. 252-49.500.
ALZA Corporation: *See*—
DuBois, Mark; Theeuwes, Felix; and Wong, Patrick S. L., 4,618,487, Cl. 424-15.000.
Ameda AG: *See*—
Beer, Christian; Riedweg, Robert; and Schlensog, Klaus, 4,617,912, Cl. 128-1.00B.
Amerace Corporation: *See*—
Pricone, Robert M.; Roberts, William N.; and Zanotti, Richard, 4,618,518, Cl. 428-40.000.
American Colloid Company: *See*—
Takeda, Hisao; and Taniguchi, Yasunori, 4,618,631, Cl. 521-109.100.
American Cyanamid Company: *See*—
Asato, Goro, 4,618,624, Cl. 514-486.000.
Li, Lehmann K.; and Marra, Michael, 4,618,086, Cl. 227-19.000.
American Hoechst Corporation: *See*—
Walls, John E.; and Liu, Shuchen, 4,618,562, Cl. 430-157.000.
American Home Products Corporation: *See*—
Burby, George C., Jr., 4,618,711, Cl. 564-86.000.
Sulkowski, Theodore S.; Silver, Paul J.; and Mascitti, Albert A., 4,618,678, Cl. 546-123.000.
American Phone Products: *See*—
Lee, Peter; Cheung, George F.; and Yee, Joe T., 4,618,917, Cl. 362-88.000.
American Safety Closure Corp.: *See*—
Costi, Vincent N., 4,618,121, Cl. 249-59.000.
AMF Incorporated: *See*—
Vecchio, Anthony J.; and Hudson, John H., Jr., 4,618,415, Cl. 209-134.000.
Amoco Corporation: *See*—
Domenico, Samuel N., 4,618,024, Cl. 181-120.000.
Amos, Walter; and Klein, Horst, to Blendax-Werke R. Schneider GmbH & Co. Toothbrush. 4,617,695, Cl. 15-195.000.
Andersen, Olaf S.: *See*—
Muller, Robert L.; and Andersen, Olaf S., 4,618,916, Cl. 361-434.000.
Andersen, Axel; and Bondergaard, Klaus, to Sincotron APS. Method and device for mounting electronic components on a printed circuit card. 4,617,728, Cl. 29-836.000.
Anderson, William J., to Nastec, Inc. Variable preload ball drive. 4,617,838, Cl. 74-798.000.
Andersson, Eilert, to Dentalvarutjanst AB. Method in the manufacture of tartar removing dental instruments. 4,617,718, Cl. 29-558.000.
Ando, Junji; and Hirose, Yoshihisa, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 4,618,019, Cl. 180-219.000.
Andrews Maclaren Limited: *See*—
Harvey, Samuel E., 4,618,184, Cl. 297-19.000.
Andrews, Patrick V.; and Kaczmarski, Edward Z., to BICC Public Limited Company. Optical fibre cutting tool. 4,618,084, Cl. 225-96.000.
Angers, John W., to Immunology Development Corporation. Human Immune Factors and processes for their production and use. 4,618,494, Cl. 424-101.000.
Anthony, James R.; and Lortz, Allan R., to Indiana Mills & Manufacturing, Inc. Child belt buckle. 4,617,705, Cl. 24-642.000.
Antonazzi, Frank J., to Allied Corporation. Stall surge detector. 4,618,856, Cl. 340-626.000.
Antoniucci, Pierluigi: *See*—
Bruno, Roberto; Azzeri, Nazzareno; Antoniucci, Pierluigi; Bocci, Giorgio; Brizielli, Sandro; and Barardi, Paolo, 4,618,379, Cl. 148-144.000.
Antrim, Richard L.: *See*—
Johnson, Richard A.; Antrim, Richard L.; and Lloyd, Norman E., 4,618,584, Cl. 435-234.000.
Anttila, Dennis A., to Motorola, Inc. Injector driver control unit with internal overvoltage protection. 4,618,908, Cl. 361-187.000.
Antunes, August J.: *See*—
Miller, Dye O.; Antunes, August J.; Antunes, Jerome; and Godsen, Ronald, 4,617,908, Cl. 126-20.000.
Antunes, Jerome: *See*—
Miller, Dye O.; Antunes, August J.; Antunes, Jerome; and Godsen, Ronald, 4,617,908, Cl. 126-20.000.
Ao, Hideki: *See*—
Araki, Kazuhiko; Ao, Hideki; Inui, Jun; and Aihara, Kenichi, 4,618,607, Cl. 514-212.000.
Aoi, Kazuo; and Tsuchida, Naoki, to Yamaha Hatsudoki Kabushiki Kaisha. Actuating mechanism for multiple valve internal combustion engine. 4,617,881, Cl. 123-90.270.
Aoyama, Masaharu; Abe, Masahiro; Ajima, Takashi; and Yonezawa, Toshio, to Kabushiki Kaisha Toshiba. Semiconductor device having a multilayer wiring structure using a polyimide resin. 4,618,878, Cl. 357-71.000.
AP Industries, Inc.: *See*—
Kotnik, Ernest J., 4,617,710, Cl. 29-268.000.
Appelle, Gerald K. Custom dental shade guide tab. 4,618,325, Cl. 433-26.000.
Applied Elastomerics, Incorporated: *See*—
Chen, John Y., 4,618,213, Cl. 350-96.340.
Applied Materials, Inc.: *See*—
Maydan, Dan; Somekh, Sasson; and Kaczorowski, Edward M., 4,618,262, Cl. 356-357.000.
Aprica Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,618,033, Cl. 188-20.000.
Apsley Metals Limited: *See*—
McGlashen, James N.; and Holroyd, Colin, 4,618,466, Cl. 264-40.600.
Arai, Masatoshi: *See*—
Takago, Toshio; Arai, Masatoshi; and Futatsumori, Koji, 4,618,646, Cl. 524-783.000.
Arai, Yasunori, to Asahi Kogaku Kogyo K.K. Focal position adjusting device for small variable-magnification type copying machine with zoom lens. 4,618,253, Cl. 355-57.000.
Arakawa Kagaku Kogyo Kabushiki Kaisha: *See*—
Tsuchida, Seiichi; Kodama, Yoshihiro; and Hara, Hirouri, 4,618,640, Cl. 524-272.000.
Arakawa, Satoshi, to Fuji Photo Optical Co., Ltd. Construction of manual control section of endoscope. 4,617,915, Cl. 128-4.000.
Arakawa, Yoshichika: *See*—
Ogasawara, Tsunehiko; Arakawa, Yoshichika; Sumiya, Koji; and Sakaguchi, Yoshikazu, 4,618,038, Cl. 192-3.290.
Araki, Kazuhiko; Ao, Hideki; Inui, Jun; and Aihara, Kenichi, to Yoshitomi Pharmaceutical Industries, Ltd. 1,4-dihydropyridine-3,5-dicarboxylic acid ester derivatives and pharmaceutical compositions. 4,618,607, Cl. 514-212.000.
Araki, Youichi; and Uetake, Yoshinari, to Kabushiki Kaisha Toshiba. Power semiconductor device with mesa type structure. 4,618,877, Cl. 357-56.000.
Aramaki, Shinji: *See*—
Suzuki, Tetsumi; Murayama, Tetsuo; Ono, Hitoshi; Aramaki, Shinji; and Yokoyama, Michiyo, 4,618,555, Cl. 430-78.000.
Ardal og Sundal Verk a.s.: *See*—
Venås, Karl, 4,618,427, Cl. 210-629.000.
Arians, Arlyn J.: *See*—
Garman, James A.; Swift, Stephen D.; Livesay, Richard E.; and Arians, Arlyn J., 4,618,190, Cl. 305-39.000.
Arima, Hideki: *See*—
Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; and Tomioka, Kenichi, 4,618,627, Cl. 514-678.000.
Arimatsu, Keiji: *See*—
Tokuyama, Shunji; Suzuki, Koji; and Arimatsu, Keiji, 4,618,905, Cl. 361-4.000.
Arioka, Hiroyuki: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; Arioka, Hiroyuki; and Kubota, Yuichi, 4,618,535, Cl. 428-325.000.
Arjomari-Prioux: *See*—
Camus, Michel, 4,618,402, Cl. 162-140.000.
Armerad Betong Vagforbattringar AB: *See*—
Bergstrom, Ulf, 4,617,776, Cl. 52-690.000.
Armitage, David, to United States of America, Air Force. Electron-bombarded silicon spatial light modulator. 4,618,217, Cl. 350-355.000.
Armstrong, Gordon M., to Fermentation Engineering, Inc. Whey treatment apparatus. 4,617,861, Cl. 99-453.000.
Arneteg, Ingemar, to Stellana Plast AB. Trolley bracket. 4,617,867, Cl. 105-154.000.
Aros Electronics AB: *See*—
Hellstroem, Jerker, 4,617,971, Cl. 139-370.200.
Arthur, Hugh M.; and Bates, Graham H., to Molins PLC. Conveying continuous filter material. 4,618,339, Cl. 493-4.000.
Artmeier, Theodor: *See*—
Gregg, Hans; and Artmeier, Theodor, 4,618,309, Cl. 414-753.000.
Asagi, Yasuyoshi: *See*—
Hattori, Toshihiro; Ishihara, Masaki; Uriuhara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,618,043, Cl. 192-0.052.
Asahi Fiber Glass Company, Limited: *See*—
Ohe, Junya; Wakita, Saburo; Yamatsuta, Kiichi; Goto, Shoji; Kutsukake, Yukinori; and Sugizaki, Masuo, 4,618,474, Cl. 420-436.000.
Asahi Glass Company, Limited: *See*—
Ohe, Junya; Wakita, Saburo; Yamatsuta, Kiichi; Goto, Shoji; Kutsukake, Yukinori; and Sugizaki, Masuo, 4,618,474, Cl. 420-436.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Uchida, Seiichi, 4,618,550, Cl. 430-11.000.
Asahi Kogaku Kogyo K.K.: *See*—
Arai, Yasunori, 4,618,253, Cl. 355-57.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Ueda, Hirohisa, 4,617,914, Cl. 128-4.000.
Asai, Ryuichi: *See*—
Mori, Masaharu; and Asai, Ryuichi, 4,618,830, Cl. 329-105.000.
Asano, Kiyomitsu; and Kondo, Toshikatsu, to Brother Kogyo Kabushiki Kaisha; and Nippon Telecommunication Engineering Company. Print head. 4,618,277, Cl. 400-124.000.
Asato, Goro, to American Cyanamid Company. 3-amino-4-hydroxy(or alkoxy)phenethanolamine derivatives and pharmacologically-acceptable acid addition salts thereof for increasing the growth rate and/or improving the lean meat to fat ratio of warm-blooded animals. 4,618,624, Cl. 514-486.000.
ASC Auto Spezial Carosserie Vertrieb GmbH: *See*—
Farmont, Rolf, 4,618,176, Cl. 292-263.000.

Asea AB: *See*—
Larsson, Hans G.; Westman, Erik; and Ostlund, Artur, 4,618,964, Cl. 373-155.000.
Rappinger, Bo; and Stenkvist, Sven-Einar, 4,618,963, Cl. 373-72.000.

Ashikawa, Noboru; and Sakuma, Shunji, to Honda Giken Kogyo Kabushiki Kaisha. Driving gear for front and rear wheels of automobile. 4,618,021, Cl. 180-248.000.

Ashland Oil, Inc.: *See*—
Grimm, Robert A.; Kyung, Jai H.; Brusky, Phyllis L.; Holehouse, Joseph G.; and Chang, Biau-hung, 4,618,707, Cl. 560-337.000.
Powell, Clois E., 4,618,390, Cl. 156-307.300.

Ashworth, Thomas, Jr. Therapeutic exercise device. 4,618,141, Cl. 272-73.000.

Aspden, Kim P.: *See*—
Rosenstein, Robert; Aspden, Kim P.; and Stopa, Peter, 4,618,576, Cl. 435-7.000.

Aspen Laboratories, Inc.: *See*—
Manes, Michael R., 4,617,927, Cl. 128-303.140.

Assaf, Gad, to Geophysical Engineering Company. Apparatus for producing power using concentrated brine. 4,617,800, Cl. 60-689.000.

Asta-Werke Aktiengesellschaft: *See*—
Scheffler, Gerhard; Niemeyer, Ulf; Brock, Norbert; and Pohl, Jorg, 4,618,692, Cl. 558-81.000.

Astrologes, Gary W.: *See*—
Elliott, Arthur J.; and Astrologes, Gary W., 4,618,718, Cl. 564-481.000.

Asulab A.S.: *See*—
Zingg, Walter, 4,618,798, Cl. 310-366.000.

Asztalos, Michael J.: *See*—
Magee, Robert D.; Asztalos, Michael J.; and Trinh, Vuong D., 4,618,824, Cl. 324-208.000.

AT&T Bell Laboratories: *See*—
Fleury, Paul A., V, 4,618,211, Cl. 350-96.150.
Gans, Michael J., 4,618,867, Cl. 343-781.00P.
Georgiou, George E.; and Poulsen, Martin E., 4,618,972, Cl. 378-34.000.
Kwilos, Jerald J., 4,618,194, Cl. 339-14.00R.
Ludington, Paul D.; and White, Ian A., 4,618,212, Cl. 350-96.210.
Swanson, Eric J., 4,618,815, Cl. 323-315.000.

AT&T Technologies, Inc.: *See*—
Fanning, William J., 4,617,708, Cl. 29-25.420.
Glantschnig, Werner J., 4,618,975, Cl. 378-51.000.

AT&T Teletype Corporation: *See*—
Jacksier, Barry H.; and Ollendick, Gary B., 4,618,787, Cl. 307-591.000.

Atlanta Cutlery Corporation: *See*—
Adams, William C.; and Taylor, William J., 4,617,951, Cl. 135-66.000.

Atlantic Richfield Company: *See*—
Dehm, David C.; and Lawson, H. Franklin, 4,618,655, Cl. 525-344.000.
Thanawalla, Chandrakant B.; and Dehm, David C., 4,618,703, Cl. 560-209.000.

Atlas, Steven A.: *See*—
Johnson, Lorin K.; Atlas, Steven A.; and Laragh, John H., 4,618,600, Cl. 514-12.000.

Atsugi Motor Parts Co., Ltd.: *See*—
Yamanouchi, Katsuto; Saitoh, Katsuo; Saito, Yoshinori; and Kikyohara, Tadashi, 4,618,417, Cl. 210-149.000.

Australian Design Marketing Pty. Ltd.: *See*—
Studwell, Kevin A. R., 4,617,773, Cl. 52-537.000.

Autoflug GmbH: *See*—
Butenop, Klaus; and Kroger, Doris, 4,618,108, Cl. 242-107.000.
Just, Herbert; and Hansen, Holger, 4,618,110, Cl. 244-151.00B.

Automobiles Citroen: *See*—
Celnik, Jean, 4,617,729, Cl. 29-840.000.
Le Salver, Robert; and Poupard, Dominique, 4,618,127, Cl. 267-8.00R.

Automobiles Peugeot: *See*—
Celnik, Jean, 4,617,729, Cl. 29-840.000.
Le Salver, Robert; and Poupard, Dominique, 4,618,127, Cl. 267-8.00R.

Automotive Products plc: *See*—
Wrobleski, David L.; Mienko, David K.; and Leigh-Monstevens, Keith V., 4,617,855, Cl. 92-5.00R.

Avnet, Inc.: *See*—
Rafal, Marc D.; Burton, Larry W.; and Joines, William T., 4,618,996, Cl. 455-46.000.

Axel, Leon: *See*—
Redington, Rowland W.; and Axel, Leon, 4,618,827, Cl. 324-309.000.

Ayano, Masami: *See*—
Sada, Masao; Kato, Michio; Ayano, Masami; Abe, Tadashi; and Moriwaki, Masanori, 4,618,709, Cl. 562-532.000.

Ayers, William R., to Central Illinois Manufacturing Co. Water removing filter media and method of making the same. 4,618,388, Cl. 156-284.000.

Azzeri, Nazzareno: *See*—
Bruno, Roberto; Azzeri, Nazzareno; Antoniucci, Pierluigi; Bocci, Giorgio; Brizielli, Sandro; and Barardi, Paolo, 4,618,379, Cl. 148-144.000.

Babu, Suryadevara V.; Horwath, Ronald S.; Lu, Neng-hsing; and Welsh, John A., to International Business Machines Corporation. Uniform plasma for drill smear removal reactor. 4,618,477, Cl. 422-186.290.

Backes, Reiner; and Langenkamp, Ulrich, to ITT Industries, Inc. Integrated delay circuit for digital signals. 4,618,788, Cl. 307-603.000.

Bacskai Huspari Kozos Vallalat: *See*—
Batorfalvi, Geza; Lendvai, Tibor; Radai, Antal; Pongrac, Gaborne ; Szabo, Miklos; and Srilardi, Jeso , 4,617,700, Cl. 17-45.000.

Badono, Shinji; and Tsutaka, Yoshikazu, to Mitsubishi Denki Kabushiki Kaisha. Digital ratemeter. 4,618,969, Cl. 377-49.000.

Badrak, Robert P.; and Mayo, Terry H., to Reed Tool Company. Hardened bearing surface and method of forming same. 4,618,269, Cl. 384-95.000.

Baglioni, Alessandro, to Medosan Industrie Biochimiche Riunite S.p.A. Ester derivatives of 7-(ω-oxyalkyl) theophylline and their pharmaceutical activity. 4,618,612, Cl. 514-265.000.

Bahn, Michael: *See*—
Engelskirchen, Konrad; Stein, Werner; Bahn, Michael; Schiefersein, Ludwig; Schindler, Joachim; and Schmid, Rolf, 4,618,582, Cl. 435-104.000.

Bainbridge, Gary R.; McCauley, Lewis D.; and Taylor, John H., to McGard, Inc. Locknut and key therefor. 4,618,299, Cl. 411-374.000.

Baji, Toru: *See*—
Sasano, Akira; Seki, Kouichi; Yamamoto, Hideaki; Baji, Toru; and Tsukada, Toshihisa, 4,618,873, Cl. 357-23.700.

Baker, Harriett V., heir: *See*—
Baker, Herbert K., deceased; and Baker, Harriett V., heir, 4,617,835, Cl. 74-677.000.

Baker, Herbert K., deceased; and by Baker, Harriett V., heir. Transmission. 4,617,835, Cl. 74-677.000.

Balazs, Zoltan: *See*—
Pal, Gabor; Esdroczi, Gabor; Hollos, Gyorgy; Nagy, Gabor; Szonyi, Gabor; Bodi Laszlo ; and Balazs, Zoltan, 4,617,830, Cl. 73-590.000.

Baldoli, Clara: *See*—
Brandi, Gabriella; Koch, Paolo; Maiorana, Stefano; Dalla Croce, Piero; and Baldoli, Clara, 4,618,439, Cl. 252-47.500.

Baldwin, David A., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Transmission systems for tracked vehicles. 4,617,836, Cl. 74-682.000.

Baliga, Bantval J., to General Electric Company. Integrated power switching semiconductor devices including IGT and MOSFET structures. 4,618,872, Cl. 357-23.400.

Ballard, Denis G. H.; Moran, Kenneth T.; and Shirley, Ian M., to Imperial Chemical Industries PLC. Conducting polymers. 4,618,454, Cl. 252-500.000.

Ballard, Lee J. Carpet handling device. 4,618,308, Cl. 414-532.000.

Balmer, Oskar: *See*—
Focke, Heinz; and Balmer, Oskar, 4,617,974, Cl. 141-239.000.

Balzer, Norbert R., to Tocco, Inc. System for hardening camshafts. 4,618,125, Cl. 266-90.000.

Balzer, Wolf-Dieter: *See*—
Weiss, Wolfram; Balzer, Wolf-Dieter; Fikentscher, Rolf; Immel, Guenther; and Wolf, Hans, 4,618,371, Cl. 106-263.000.

Banninger, Urs, to Swiss Aluminium Ltd. Caterpillar type mold having mold links with chamfered edges. 4,617,980, Cl. 164-430.000.

Barardi, Paolo: *See*—
Bruno, Roberto; Azzeri, Nazzareno; Antoniucci, Pierluigi; Bocci, Giorgio; Brizielli, Sandro; and Barardi, Paolo, 4,618,379, Cl. 148-144.000.

Barber, David C.: *See*—
Brown, Brian H.; Barber, David C.; and Freeston, Ian L., 4,617,939, Cl. 128-734.000.

Bardle Servovalve Co.: *See*—
Nicholson, Robert D., 4,617,966, Cl. 137-625.620.

Barker, Douglas R.: *See*—
Gegel, Harold L.; Malas, James C.; Prasad, Yellapregada V. R. K.; Dorasivelu, Sokka M.; Barker, Douglas R.; Morgan, James T., Jr.; and Lark, Kristine A., 4,617,817, Cl. 72-364.000.

Barnard, Richard. Dryer insert, holder, container. 4,617,743, Cl. 34-109.000.

Barnes, Andrew; Elliott, Gary K.; MacFarlane, William; and Pheasant, Stephen T., to Foseco Trading A.G. Refractory, heat-insulating slabs. 4,618,079, Cl. 222-591.000.

Barnes, Robert S.: *See*—
Campbell, James R., 4,618,152, Cl. 277-53.000.

Baron, Heinz; Hoefer, Peter; and Schwind, Herbert, to Titmus Eurocon Kontaktlinsen GmbH. Bifocal contact lens of the bivisual type. 4,618,228, Cl. 351-161.000.

Barrett, John: *See*—
Hudson, John O.; Schleien, Mickey M.; and Barrett, John, 4,618,444, Cl. 252-92.000.

Barry Wright Corporation: *See*—
Nardella, Michael A.; and Cournoyer, Bernard T., 4,618,118, Cl. 248-243.000.

Barsumian, Edward A.: *See*—
Hargrave, Karl D.; Devlin, John P.; and Barsumian, Edward A., 4,618,677, Cl. 544-400.000.

Bartfield, William; and Ferguson, Charles L. Cup dispensing apparatus. 4,618,073, Cl. 221-11.000.

Barth, Jon E. Microwave attenuator. 4,618,839, Cl. 333-81.00A.

Bartnik, Mieczyslaw: *See*—
Saternus, Antoni; Miczek, Ludwik; and Bartnik, Mieczyslaw, 4,618,376, Cl. 134-26.000.

Bartolomeo, Mark E., to Eaton Corporation. Stroboscopic method for determining gear mesh quality. 4,618,256, Cl. 356-23.000.

BASF Aktiengesellschaft: *See*—
Becker, Rainer; Jahn, Dieter; Schirmer, Ulrich; Schott, Eberhard P.; Hesse, Bernhard; and Jung, Johann, 4,618,362, Cl. 71-88.000.
Ebel, Klaus; and Reuther, Wolfgang, 4,618,676, Cl. 544-196.000.
Iden, Rudiger; and Seybold, Gunther, 4,618,694, Cl. 558-416.000.
Lenz, Hans-Heinrich, 4,618,725, Cl. 568-315.000.
Muench, Volker; Hambrecht, Juergen; Naarmann, Herbert; Echte, Adolf; and Illers, Karl H., 4,618,636, Cl. 524-176.000.
Muench, Volker; Hambrecht, Juergen; Himmele, Walter; Echte, Adolf; and Swoboda, Johann, 4,618,668, Cl. 528-215.000.
Schlecker, Rainer; Schmidt, Peter; Thieme, Peter C.; Lenke, Dieter; Teschendorf, Hans-Jurgen; Traut, Martin; Mueller, Claus D.; Hofmann, Hans P.; and Kreiskott, Horst, 4,618,622, Cl. 514-457.000.
Taubitz, Christof; Muench, Volker; Hambrecht, Juergen; Echte, Adolf; and Illers, Karl H., 4,618,633, Cl. 524-80.000.
Weiss, Wolfram; Balzer, Wolf-Dieter; Fikentscher, Rolf; Immel, Guenther; and Wolf, Hans, 4,618,371, Cl. 106-263.000.
Weitz, Hans-Martin; and Fischer, Rolf, 4,618,704, Cl. 560-262.000.

BASF Corporation: *See*—
Patil, Arvind S.; and Pepoy, Louis J., 4,618,375, Cl. 106-304.000.

Basotherm GmbH: *See*—
Hofmann-Igl, Ernest, 4,617,949, Cl. 132-88.500.

Bass, Robert J.: *See*—
Richardson, Kenneth; Bass, Robert J.; and Cooper, Kelvin, 4,618,616, Cl. 514-340.000.

Bates, Graham H.: *See*—
Arthur, Hugh M.; and Bates, Graham H., 4,618,339, Cl. 493-4.000.

Batorfalvi, Geza; Lendvai, Tibor; Radai, Antal; Pongrac, Gaborne ; Szabo, Miklos; and Szilardi, Jeno , to Orszagos Husipari Kutatointezet; and Bacskai Husipari Kozos Vallalat. Process and apparatus for the hygienic extraction and collection of animal blood fit and unfit for human consumption. 4,617,700, Cl. 17-45.000.

Batra, Vijay K. Air shoe. 4,617,745, Cl. 36-3.00B.

Battelle Development Corporation: *See*—
Harmer, Alan L., 4,618,764, Cl. 250-227.000.
Maringer, Robert E., 4,617,981, Cl. 164-453.000.

Batten, Ronald W., to VSI Corporation. Removable key for wrenching tool. 4,617,844, Cl. 81-436.000.

Baudry, Hugues, to U.S. Philips Corporation. Starting mixture for a dielectric composition. 4,618,590, Cl. 501-17.000.

Bauer, Karl-Heinz. Multi-purpose furniture piece. 4,618,183, Cl. 297-2.000.

Baughman, Gary M.: *See*—
Hamman, Martin E.; and Baughman, Gary M., 4,618,078, Cl. 222-478.000.

Baum, Kurt; Hunadi, Ronald O.; and Bedford, Clifford D., to Fluorochem Inc. Method of making and polymerizing perfluoroalkylene acetylene compounds. 4,618,734, Cl. 570-136.000.

Bauman, Therese M.; and Huebner, David J., to Dow Corning Corporation. Method of producing aqueous latex of crosslinked polydiorganosiloxane. 4,618,645, Cl. 524-745.000.

Bausch & Lomb Incorporated: *See*—
Jacobstein, Benjamin L.; Mestrits, Thomas J.; and Miller, Murray, 4,618,229, Cl. 351-161.000.

Bautista, Val: *See*—
Lescrenier, Charles; and Bautista, Val, 4,618,980, Cl. 378-206.000.

Bay, W. Elliot; and Reineke, Karl E., to Stauffer Chemical Company. Addition of phosphines to alpha-olefins. 4,618,719, Cl. 568-17.000.

Bay, W. Elliott; Reineke, Karl E.; and Weil, Edward D., to Stauffer Chemical Company. Preparation of alkyldiarylphosphines. 4,618,720, Cl. 568-17.000.

Bayer Aktiengesellschaft: *See*—
Beitzke, Bernhard, 4,618,698, Cl. 560-060.000.
Regel, Erik; Buchel, Karl H.; Reinecke, Paul; and Brandes, Wilhelm, 4,618,619, Cl. 514-383.000.
Schneider, Manfred; and Laumen, Kurt, 4,618,690, Cl. 556-441.000.
Scholl, Hans-Joachim; and Hettel, Hans, 4,618,706, Cl. 560-335.000.
Volland, Robert; Freitag, Hans-Albrecht; Seesing, Johannes; and Bergmann, Herbert, 4,618,532, Cl. 428-304.400.

Bayne, Robert T.; and Heidelberger, James E., to Standard Change-Makers, Inc. Color-sensitive currency verifier. 4,618,257, Cl. 356-71.000.

Bayshore, Charles A., to Vistakon, Inc. Soft contact lens. 4,618,227, Cl. 351-161.000.

BBC Brown, Boveri & Company Limited: *See*—
Vitins, Michael, 4,618,933, Cl. 364-481.000.

Beach, Marvin F. Process for converting casein to caseinate. 4,618,502, Cl. 426-583.000.

Beattie, Craig W.: *See*—
Ens, John; McEwen, James A.; and Beattie, Craig W., 4,618,230, Cl. 351-221.000.

Bechu, Jean-Pierre, to Caoutchouc Manufacture et Plastiques. Vibration damping arrangement. 4,618,129, Cl. 267-140.100.

Beck, Harold K., to Halliburton Company. Downhole tool with compression chamber. 4,617,999, Cl. 166-372.000.

Beck, Leonard H., to Du Pont de Nemours, E. I., and Company. Process for purifying 2-perfluoroalkylethanols. 4,618,731, Cl. 568-842.000.

Beck, William R.; Jahn, William; Koltenback, Steven R.; Scharf, Robert M.; and Schwab, Ronald, to Thomas & Betts Corporation. Method for termination of flat cable. 4,617,732, Cl. 29-866.000.

Becker, Floyd W. Dual-wall drill pipe. 4,618,172, Cl. 285-141.000.

Becker, Helmut: *See*—
Sturm, Walter; Becker, Helmut; Witt, Jurgen; Fritz, Werner; and Eysholdt, Ursula, 4,618,776, Cl. 250-372.000.

Becker, Rainer; Jahn, Dieter; Schirmer, Ulrich; Schott, Eberhard P.; Hesse, Bernhard; and Jung, Johann, to BASF Aktiengesellschaft. Increasing the sugar content of plants. 4,618,362, Cl. 71-88.000.

Beckman Industrial Corporation: *See*—
Farren, Carl A., 4,618,771, Cl. 250-343.000.

Becton, Dickinson and Company: *See*—
Kopacz, Bernard F., 4,617,738, Cl. 30-339.000.
Rosenstein, Robert; Aspden, Kim P.; and Stopa, Peter, 4,618,576, Cl. 435-7.000.

Bedford, Clifford D.: *See*—
Baum, Kurt; Hunadi, Ronald O.; and Bedford, Clifford D., 4,618,734, Cl. 570-136.000.

Beeland, William D.: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; and Beeland, William D., 4,617,862, Cl. 100-53.000.

Beer, Christian; Riedweg, Robert; and Schlensog, Klaus, to Ameda AG. Incubator. 4,617,912, Cl. 128-1.00B.

Beitzke, Bernhard, to Bayer Aktiengesellschaft. Process for the preparation of a mixture of an optionally substituted cinnamic acid ester and an optionally substituted β-alkoxy-β-phenyl-propionic acid ester, and a process for the preparation of optionally substituted cinnamic acid. 4,618,698, Cl. 560-060.000.

Belch, Francis R., to Ferranti plc. Information display system having a multiple cell raster scan display. 4,618,858, Cl. 340-724.000.

Bell, Allyn R.: *See*—
Covey, Rupert A.; Forbes, Patricia J.; and Bell, Allyn R., 4,618,365, Cl. 71-92.000.

Bell & Howell Company: *See*—
Wells, Thomas R., 4,618,232, Cl. 353-79.000.

Bell, James C., to Oliver Industries, Inc. Luggage rack. 4,618,082, Cl. 224-321.000.

Bellheimer Metallwerk GmbH: *See*—
Sauer, Hans-Peter, 4,618,932, Cl. 364-478.000.

Belloche, Alain. Installation and method for supplying merchandise to sales display structures. 4,618,031, Cl. 186-52.000.

Belokin, Paul, Jr. Display device module with multiple shelves. 4,618,115, Cl. 248-174.000.

Bender, Rudolf: *See*—
Vertesy, Laszlo ; Bender, Rudolf; and Fehlhaber, Hans-Wolfram, 4,618,602, Cl. 514-54.000.

Benko, Pal: *See*—
Budai, Zoltan; Benko, Pal; Ratz nee Simonek, Ildiko ; Rakoczy nee Pinter, Eva; Magyar, Karoly; Kelemen, Jozsef; and Mandi, Attila, 4,618,623, Cl. 514-478.000.

Benn, Frederick R.; and McAuliffe, Charles A., to Salford University Industrial Centre Limited. Conversion of a municipal waste to fuel. 4,618,736, Cl. 585-240.000.

Berde, Dennis; and Youskites, Edward, to Grumman Aerospace Corporation. Video color transmission system with independent audio signals within the video signals. 4,618,889, Cl. 358-144.000.

Bergman, Roger W.; and Smith, Harry A., to Dow Chemical Company, The. O,O'-, O,S'- or S,S'-dithiodialkylene-bis(mono- or dihydrocarbyl carbamothioates) and S,S'-dithiodialkylene-bis(mono- or dihydrocarbyl carbamodithioates) and method of preparation thereof. 4,618,461, Cl. 558-234.000.

Bergmann, Herbert: *See*—
Volland, Robert; Freitag, Hans-Albrecht; Seesing, Johannes; and Bergmann, Herbert, 4,618,532, Cl. 428-304.400.

Bergstrom, Ulf, to Armerad Betong Vagforbattringar AB. Building element having spaced longitudinal members with each member having a different moisture content. 4,617,776, Cl. 52-690.000.

Berman, Jody R.; Steele, Dennis L.; and Kubisiak, Michael P., to Dow Chemical Company, The. Curable compositions containing multiglycidyl ethers and a sulfonic acid amide. 4,618,526, Cl. 428-209.000.

Bernard, Milton S., to Vertac Chemical Corporation. Novel herbicidal salt. 4,618,367, Cl. 71-121.000.

Bernasconi, Carlo: *See*—
Horvath, Stephan; and Bernasconi, Carlo, 4,618,982, Cl. 381-36.000.

Berthelsen, Ernst R., to Dac-Emballage A.M.B.A. Valve bag. 4,618,993, Cl. 383-44.000.

Betzing, Hans: *See*—
Dereu, Norbert; Welter, Andre ; Wendel, Albrecht; Leyck, Sigurd; Parnham, Michael; Graf, Erich; Sies, Helmut; Betzing, Hans; and Fischer, Hartmut, 4,618,669, Cl. 530-331.000.

Beyer, Wolfgang: *See*—
Bohme, Klaus; Beyer, Wolfgang; Seibt, Gunter; and Digmayer, Michael, 4,618,749, Cl. 200-144.00B.

Bezier, Jean: *See*—
Franzolini, Marc; Maria, Edmond; Vanderschaeghe, Alain; and Bezier, Jean, 4,617,990, Cl. 165-173.000.

BICC Public Limited Company: *See*—
Andrews, Patrick V.; and Kaczmarski, Edward Z., 4,618,084, Cl. 225-96.000.

Bierlein, John C.: *See*—
MacIver, Bernard A.; Erskine, James C., Jr.; and Bierlein, John C., 4,618,505, Cl. 427-38.000.

Big-Inch Marine Systems, Inc.: *See*—
Dopyera, Emil E.; and Miller, Jack E., 4,618,173, Cl. 285-261.000.

Bildner, Karlheinz: *See*—
Ruhl, Karl; and Bildner, Karlheinz, 4,618,521, Cl. 428-137.000.

Bilharz, Manfred; Heider, Peter; Roper, Hartmut; Taal, Martin; Henken, Fritz; Kohl, Ernst; and Schubert, Dietmar, to Ford Motor Company. Valve system for a hydraulically controlled starting friction clutch. 4,618,123, Cl. 251-28.000.

Biotechnology Research Associates, J.V.: *See—*
Johnson, Lorin K.; Atlas, Steven A.; and Laragh, John H., 4,618,600, Cl. 514-12.000.

Birk, Adalbert, to Siemens Aktiengesellschaft. Method and apparatus for representing ultrasonic echo signals arriving in polar coordinates. 4,618,887, Cl. 358-112.000.

Birkner, Christian: *See—*
Stapel, Gunter; Gober, Karl-Heinz; Leyck, Sigurd; Wetzig, Helmut; Birkner, Christian; Kesselring, Kurt; Christ, Bruno; Steiner, Klaus; and Schroder, Friedhelm, 4,618,605, Cl. 514-177.000.

Bishop, Arthur E.; and Roeske, Klaus J., to Bishop, Arthur E. Method and apparatus for machining racks for steering gear. 4,618,297, Cl. 409-58.000.

Bishop, David C., to Smiths Industries Public Limited Company. Taps. 4,618,994, Cl. 383-96.000.

Bishop, Thomas D., to DEC (Realisations) Limited. Machine for the treatment web material. 4,617,850, Cl. 83-324.000.

Biuro Studiow i Projektow Energetycznych "Energoprojekt": *See—*
Saternus, Antoni; Miczek, Ludwik; and Bartnik, Mieczyslaw, 4,618,376, Cl. 134-26.000.

Blackman, Kent G., to Suter Company, Inc., The. Apparatus to facilitate hand packing of containers. 4,617,778, Cl. 53-391.000.

Blandenet, Gerard; Chazee, Jean-Jacques; and Court, Michel, to Commissariat a l'Energie Atomique. Process for producing composite layers. 4,618,508, Cl. 427-57.000.

Blattler, Walter A.; Lambert, John M.; and Senter, Peter D., to Dana-Farber Cancer Institute, Inc. Acid-cleavable compound. 4,618,492, Cl. 424-85.000.

Blaylock, Michael A. Egg cooking device. 4,617,860, Cl. 99-415.000.

Blendax-Werke R. Schneider GmbH & Co.: *See—*
Amos, Walter; and Klein, Horst, 4,617,695, Cl. 15-195.000.

Blomquist, James E.; and Wilczewski, Robert H. Dot matrix print head. 4,618,276, Cl. 400-124.000.

Blouin, John J., to W. R. Grace & Co. Drilling fluids made from solid, free-flowing, continuously-made, water dispersible PVA-aldehyde reaction product. 4,618,434, Cl. 252-8.510.

BM Digiflow A/S: *See—*
Melgaard, Oluf, 4,617,955, Cl. 137-240.000.

BMD Badische Maschinenfabrik Durlach GmbH: *See—*
Damm, Norbert, 4,617,978, Cl. 164-37.000.

Board of Regents, The University of Texas System: *See—*
Chan, Teh-sheng, 4,618,585, Cl. 435-240.000.

Bobsein, Louis E.: *See—*
Fisher, Marvin D.; and Bobsein, Louis E., 4,618,387, Cl. 156-244.110.

Bobst SA: *See—*
Borel, Edouard, 4,618,342, Cl. 493-30.000.

Bocci, Giorgio: *See—*
Bruno, Roberto; Azzeri, Nazzareno; Antoniucci, Pierluigi; Bocci, Giorgio; Brizielli, Sandro; and Barardi, Paolo, 4,618,379, Cl. 148-144.000.

Bochor, Meir; and Gura, Mordechai, to Fibronics Ltd. Communication of unipolar pulses. 4,618,952, Cl. 370-78.000.

Bodendorf, Warren J., to Texon, Inc. Battery separator material. 4,618,401, Cl. 162-138.000.

Bodenmiller, Anton: *See—*
Schmidt, Helmut; Bodenmiller, Anton; and Straka, Alfred, 4,618,326, Cl. 433-79.000.

Bodi Laszlo : *See—*
Pal, Gabor; Endroczi, Gabor; Hollos, Gyorgy; Nagy, Gabor; Szonyi, Gabor; Bodi Laszlo ; and Balazs, Zoltan, 4,617,830, Cl. 73-590.000.

Boehringer Ingelheim Limited: *See—*
Hargrave, Karl D.; Devlin, John P.; and Barsumian, Edward A., 4,618,677, Cl. 544-400.000.

Boeing Company, The: *See—*
Shaw, Christopher G.; and Kramer, Ted J., 4,618,218, Cl. 350-363.000.
Victor, Paul F., 4,618,109, Cl. 244-130.000.
Wallace, John E., 4,618,755, Cl. 200-175.000.

Boeve, Gerard J.; and Vierveijzer, Franciscus, to Agfa-Gevaert N.V. Sheet imaging apparatus. 4,618,137, Cl. 271-219.000.

Boger, Manfred; and Drabek, Jozef, to Ciba-Geigy Corporation. Oxadiazines and pesticidal compositions containing them. 4,618,608, Cl. 514-235.000.

Bohme, Klaus; Beyer, Wolfgang; Seibt, Gunter; and Digmayer, Michael, to VEB Otto Buchwitz Starkstrom Anlagebau Dresden. Solid insulator-type vacuum switch gear. 4,618,749, Cl. 200-144.00B.

Bond, Michael E.; and Noll, Robert S., to Emhart Corporation. Tool for drilling and securing screw anchor to a wall. 4,617,692, Cl. 7-158.000.

Bondergaard, Klaus: *See—*
Anderseu, Axel; and Bondergaard, Klaus, 4,617,728, Cl. 29-836.000.

Booth, Inc.: *See—*
Pritchett, James D.; and Cutbush, James D., 4,617,807, Cl. 62-399.000.

Bordeaux, Marvin L.; and Ward, Dennis R. Electronic rangefinder for archery. 4,617,741, Cl. 33-228.000.

Borden, Albert R., to United States of America, Energy. Apparatus and method for fabricating multi-strand superconducting cable. 4,617,789, Cl. 57-6.000.

Borel, Edouard, to Bobst SA. Machine for processing web material. 4,618,342, Cl. 493-30.000.

Bori, Jacques, to Team, Inc. Finger-mounted device for cleaning teeth. 4,617,694, Cl. 15-167.00R.

Born, Raymond W. Method and apparatus for shipping and storing cargo. 4,618,068, Cl. 220-4.00R.

Borsenberger, Paul M.; Regan, Michael T.; and Staudenmayer, William J., to Eastman Kodak Company. Multi-active photoconductive insulating elements exhibiting very high electrophotographic speed and panchromatic sensitivity and method for their manufacture. 4,618,560, Cl. 430-130.000.

Borzatta, Valerio: *See—*
Cantatore, Giuseppe; and Borzatta, Valerio, 4,618,634, Cl. 524-97.000.

Bosna, Alexander A.; and Riccio, Louis M. Method and apparatus for applying metal cladding on surfaces and products formed thereby. 4,618,504, Cl. 427-34.000.

Bottcher, Henning: *See—*
Hausberg, Hans-Heinrich; Bottcher, Henning; Gottschlich, Rudolf; Seyfried, Christoph; and Minck, Klaus-Otto, 4,618,614, Cl. 514-321.000.

Bottega, Giampietro: *See—*
Sartor, Rino; and Bottega, Giampietro, 4,618,226, Cl. 351-113.000.

Boyer, Stephen K., to Ciba-Geigy Corporation. Process for dehalogenation of aryl and alpha-araliphatic halides. 4,618,686, Cl. 549-360.000.

Bradshaw, Robert W.: *See—*
Thompson, Thomas D., III; Polestak, Walter J.; and Bradshaw, Robert W., 4,618,374, Cl. 106-288.00B.

Braitrim (London) Limited: *See—*
Shalson, Peter, 4,618,080, Cl. 223-95.000.

Bramwell, David W., to EGA Limited. Adaptor for connecting raceway trunking to a box for electrical components, and the adaptor and box in combination. 4,618,741, Cl. 174-68.00C.

Brand, Donald L.: *See—*
Miller, William H.; McClendon, Samuel E.; Kolodziej, Raymond J.; and Brand, Donald L., 4,618,931, Cl. 364-431.020.

Brandenstein, Manfred; Haas, Roland; Herrmann, Gerhard; Friedrich, Wolfgang; and Edelmann, Ludwig, to SKF Kugellagerfabriken GmbH. Tension-adjusting device for driving belt. 4,618,335, Cl. 474-112.000.

Brandes, Wilhelm: *See—*
Regel, Erik; Buchel, Karl H.; Reinecke, Paul; and Brandes, Wilhelm, 4,618,619, Cl. 514-383.000.

Brandi, Gabriella; Koch, Paolo; Maiorana, Stefano; Dalla Croce, Piero; and Baldoli, Clara, to AGIP Petroli S.p.A.; and Consiglio Nazionale Delle Ricerche. Multifunctional additive for lubrificating oils and process for the preparation thereof. 4,618,439, Cl. 252-47.500.

Branson Ultrasonics Corporation: *See—*
Sager, Thomas B., 4,618,516, Cl. 428-35.000.

Brasser, Jan: *See—*
Vos, Cornelis; and Brasser, Jan, 4,617,945, Cl. 131-310.000.

Brasseur, Raynald, to Johnson & Johnson. Antimicrobial peat moss composition. 4,618,496, Cl. 424-195.100.

Bratt, Richard G.; Gruner, Ronald H.; Jones, Thomas M.; and Nealon, James T., to Data General Corporation. Digital data processing system capable of executing a plurality of internal language dialects. 4,618,925, Cl. 364-200.000.

Braun, Joseph T.; and Smith, Schuyler B., to Dow Corning Corporation. Process to prepare 2-phenylpropyl containing polydiorganosiloxanes. 4,618,665, Cl. 528-25.000.

Brettschneider, Horst; Hartl, Walter; and Peter, Diethard, to U.S. Philips Corporation. X-ray tube comprising an at least partly metal housing and an electrode which carries a positive high voltage with respect thereto. 4,618,977, Cl. 378-139.000.

Breucha, Hermann. Cutting implement for removing plastic sealing strips from joints between reinforced concrete elements. 4,618,395, Cl. 156-584.000.

Bridgestone Corporation: *See—*
Kawajiri, Junichi, 4,617,976, Cl. 152-209.00R.

Bridle, Trevor R.; and Campbell, Herbert W., to Canadian Patents and Development Limited. Process and apparatus for the conversion of sludges. 4,618,735, Cl. 585-240.000.

Brinckman, Frederick E.; Degnan, Thomas F., Jr.; and Weiss, Carl S., to United States of America, Commerce. Shale oil dearsenation process. 4,618,410, Cl. 208-97.000.

Brinkman, Robert J., to C. J. Winter Machine Works. Thread rolling attachment. 4,617,816, Cl. 72-104.000.

Brinkmann, Gerhard; and Wietrzynski, Bolko, to Olympia Werke AG. Method for resetting the printing head of a typewriter. 4,618,275, Cl. 400-76.000.

Brisco, John S.: *See—*
Peel, Harry H.; Brisco, John S.; Moczygemba, Mark E.; Neatherlin, Robert L.; and Sargent, Brenda A., 4,617,937, Cl. 128-680.000.

Brizielli, Sandro: *See—*
Bruno, Roberto; Azzeri, Nazzareno; Antoniucci, Pierluigi; Bocci, Giorgio; Brizielli, Sandro; and Barardi, Paolo, 4,618,379, Cl. 148-144.000.

Brock, Norbert: *See—*
Scheffler, Gerhard; Niemeyer, Ulf; Brock, Norbert; and Pohl, Jorg, 4,618,692, Cl. 558-81.000.

Brode, George L.: *See—*
Fan, You-Ling; Brode, George L.; and Rosen, Meyer R., 4,618,647, Cl. 524-801.000.

Brooks, Alan C. Explosion proof battery. 4,618,544, Cl. 429-53.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Asano, Kiyomitsu; and Kondo, Toshikatsu, 4,618,277, Cl. 400-124.000.

Brown, Alfred, to Texaco Inc. Carbon dioxide stimulated oil recovery process. 4,617,993, Cl. 166-250.000.

Brown, Brian H.; Barber, David C.; and Freeston, Ian L., to University of Sheffield, The. Tomography. 4,617,939, Cl. 128-734.000.

Brown, Peter L. Physical exercising apparatus. 4,618,140, Cl. 272-72.000.

Brown, Warren D., to Sprayton Equipment Company. Concrete feeder apparatus. 4,618,294, Cl. 406-113.000.

Brown & Williamson Tobacco Corporation: *See*—
Keith, Charles H., 4,617,946, Cl. 131-336.000.

Bruestle, John H., to RCA Corporation. Gray code counter. 4,618,849, Cl. 340-347.0DD.

Brule, James E., to Combustion Engineering, Inc. Electrolyte additive. 4,618,548, Cl. 429-194.000.

Brummel, Roger L., to Fluidtherm Corporation. Heat treat apparatus. 4,617,742, Cl. 34-57.00A.

Brunner, Hans-Georg, to Ciba-Geigy Corporation. Cyclohexanedionecarboxylic acid derivatives with herbicidal and plant growth regulating properties. 4,618,360, Cl. 71-88.000.

Brunner, Rudolf, to Heilmeier & Weinlein Fabrik fur Oel-Hydraulik GmbH & Co., KG. Hydraulic device. 4,617,962, Cl. 137-613.000.

Bruno, Roberto; Azzeri, Nazzareno; Antoniucci, Pierluigi; Bocci, Giorgio; Brizielli, Sandro; and Barardi, Paolo. Method for the continuous annealing of steel strips. 4,618,379, Cl. 148-144.000.

Brunswick Corporation: *See*—
Staerzl, Richard E., 4,617,892, Cl. 123-352.000.

Brusky, Phyllis L.: *See*—
Grimm, Robert A.; Kyung, Jai H.; Brusky, Phyllis L.; Holehouse, Joseph G.; and Chang, Biau-hung, 4,618,707, Cl. 560-337.000.

Bruzzone, Mario: *See*—
Roggero, Arnaldo; and Bruzzone, Mario, 4,618,449, Cl. 252-182.000.

Buchanan, Michael S., to Wm. T. Burnett & Co., Inc. Fragrance-emitting polyurethane foams. 4,618,629, Cl. 521-76.000.

Buchar, Wayne A., to Xerox Corporation. Test patch generation utilizing system scan optics. 4,618,248, Cl. 355-14.00R.

Buchel, Karl H.: *See*—
Regel, Erik; Buchel, Karl H.; Reinecke, Paul; and Brandes, Wilhelm, 4,618,619, Cl. 514-383.000.

Buckley, Thomas F., III: *See*—
Rapoport, Henry; and Buckley, Thomas F., III, 4,618,710, Cl. 564-1.000.

Budai, Zoltan; Benko, Pal; Ratz nee Simonek, Ildiko ; Rakoczy nee Pinter, Eva; Magyar, Karoly; Kelemen, Jozsef; and Mandi, Attila, to Egyt Gyogyszervegyeszeti Gyar. Carbazic acid derivatives, process for their preparation and compositions containing the same. 4,618,623, Cl. 514-478.000.

Budd Company, The: *See*—
Kozyra, William L.; MacIsaac, Andrew B.; and Santoro, Vincent J., 4,618,159, Cl. 280-93.000.

Bulkowski, John E., to University of Delaware. Arrays of stacked metal coordination compounds. 4,618,509, Cl. 427-74.000.

Burger, Hans-Joachim; and Schuster, Hubert, to Siemens Aktiengesellschaft. Method for sealing cavities. 4,618,467, Cl. 264-46.600.

Burgess, Andre S.: *See*—
Alcorn, George E.; and Burgess, Andre S., 4,618,380, Cl. 148-187.000.

Burke, Rae L.; Urdea, Mickey S.; and Valenzuela, Pablo D. T., to Chiron Corporation. Expression of glycoprotein D of herpes simplex virus. 4,618,578, Cl. 435-68.000.

Burke, William F.; and Winiecki, Alan L., to United States of America, Energy. Remote temperature-set-point controller. 4,618,267, Cl. 374-50.000.

Burlington Industries, Inc.: *See*—
Cochran, James A., 4,618,059, Cl. 206-392.000.

Burris, Wesley J., II, to Halliburton Company. Pump open safety valve and method of use. 4,618,000, Cl. 166-373.000.

Burton, Larry W.: *See*—
Rafal, Marc D.; Burton, Larry W.; and Joines, William T., 4,618,996, Cl. 455-46.000.

Bury, George J., to Illinois Tool Works Inc. Support member for electrical components. 4,618,915, Cl. 361-400.000.

Bussink, Jan: *See*—
Lohmeijer, Johannes H. G. M.; Noordermeer, Jacobus W. M.; and Bussink, Jan, 4,618,637, Cl. 524-192.000.

Butenop, Klaus; and Kroger, Doris, to Autoflug GmbH. Safety belt reel-in mechanism having a tensioning arrangement. 4,618,108, Cl. 242-107.000.

Butler, John M., III: *See*—
Cooper, Glenn D.; Butler, John M., III; Morrison, Darrell R.; Senic, Charles L.; Nilsson, Lennart S.; and Rowe, Charles M., 4,618,795, Cl. 310-260.000.

Buzby, George C., Jr., to American Home Products Corporation. Anti-arrhythmic agents. 4,618,711, Cl. 564-86.000.

Buzzi, Guenter, to Hans Grohe GmbH & Co. KG. Apparatus for controlling the passage of a liquid. 4,618,091, Cl. 236-12.120.

C. C. Sales Corporation: *See*—
Cosson, Keith J., 4,618,006, Cl. 172-699.000.

C. J. Winter Machine Works: *See*—
Brinkman, Robert J., 4,617,816, Cl. 72-104.000.

Cabalquinto, Santiago C.: *See*—
Lay, Khin M.; Palguta, Stephen E.; Fernandez, Ramon B.; and Cabalquinto, Santiago C., 4,617,716, Cl. 29-526.00R.

Cabany, Pierre; Gardette, Andre; Jacquet, Xavier; Tollis, Aurelio; and Tollis, Fernando, to Constructions Soudees du Coteau. Method and apparatus for manufacturing large, metal cylindrical structures. 4,618,757, Cl. 219-60.00R.

Calgon Corporation: *See*—
Cha, Charles Y.; Varsanik, Richard G.; and Chen, Shih-Ruey T., 4,618,448, Cl. 252-180.000.

Calzi, Claudio: *See*—
Premoli, Pietro; Manzoni, Angelo; and Calzi, Claudio, 4,618,587, Cl. 436-74.000.

Campbell, Guy A. Ladder platform. 4,618,030, Cl. 182-121.000.

Campbell, Herbert W.: *See*—
Bridle, Trevor R.; and Campbell, Herbert W., 4,618,735, Cl. 585-240.000.

Campbell, James R., to Mahoney, Thomas P.; Ruston, Donald A.; and Barnes, Robert S., part interest to each. Honeycomb seal structure. 4,618,152, Cl. 277-53.000.

Campbell, Simon F.: *See*—
Alker, David; Campbell, Simon F.; and Cross, Peter E., 4,618,609, Cl. 514-236.000.

Campisi, Carl; and Kay, Brian D., to Zenith Electronics Corporation. PC board hold down system. 4,618,131, Cl. 269-32.000.

Camus, Michel, to Arjomari-Prioux. Safety means, paper and document against falsification by chemical agent. 4,618,402, Cl. 162-140.000.

Canadian Patents and Development Limited: *See*—
Bridle, Trevor R.; and Campbell, Herbert W., 4,618,735, Cl. 585-240.000.

Canon Kabushiki Kaisha: *See*—
Akashi, Akira; Ishizaki, Akira; Hiramatsu, Akira; Suda, Yasuo; and Ohtaka, Keiji, 4,618,236, Cl. 354-406.000.
Hattori, Jun; and Tsuji, Sadahiko, 4,618,762, Cl. 250-201.000.
Kato, Masatake, 4,618,220, Cl. 350-427.000.
Munakata, Hirohide; Tomida, Yoshinori; Haruta, Masahiro; Hirai, Yutaka; Nishimura, Yukuo; and Hamamoto, Takashi, 4,618,561, Cl. 430-156.000.
Nagashima, Nao; Suzuki, Koji; Nagahira, Jyoji; Kuroda, Kouki; and Takayanagi, Yoshiaki, 4,618,246, Cl. 355-14.00R.
Sakurai, Masaaki; and Kagiura, Kazuo, 4,618,240, Cl. 355-3.0FU.
Sugiura, Muneharu; Fujibayashi, Kazuo; and Tsuji, Sadahiko, 4,618,219, Cl. 350-427.000.
Takano, Katsuhiko; Iijima, Shigeharu; Yoshihara, Satoshi; Matsushima, Masaaki; Kishi, Hiroyoshi; and Sasamori, Eizo, 4,618,537, Cl. 428-336.000.
Takenouchi, Masanori, 4,618,556, Cl. 430-110.000.
Tanaka, Shigemori; Sumino, Fumio; and Toma, Hitoshi, 4,618,552, Cl. 430-60.000.
Yanagawa, Hitoshi; Nagasawa, Takeshi; Inoue, Shunzo; Iwaya, Toshio; and Murata, Shinji, 4,618,251, Cl. 355-28.000.
Yashiki, Yuichi, 4,618,559, Cl. 430-127.000.

Cantatore, Giuseppe; and Borzatta, Valerio, to Ciba-Geigy S.p.A. Compounds containing piperidine groups, as stabilizers for synthetic polymers. 4,618,634, Cl. 524-97.000.

Caoutchouc Manufacture et Plastiques: *See*—
Bechu, Jean-Pierre, 4,618,129, Cl. 267-140.100.

Carino, John W.: *See*—
Strange, Thomas F.; and Carino, John W., 4,618,910, Cl. 361-275.000.

Carl Freudenberg, Firma: *See*—
Groitzsch, Dieter; and Fahrbach, Erich, 4,618,524, Cl. 428-198.000.

Carl Hurth Maschinen und Zahnradfabrik GmbH & Co.: *See*—
Gregg, Hans; and Artmeier, Theodor, 4,618,309, Cl. 414-753.000.

Carl-Zeiss-Stiftung: *See*—
Muller, Gerhard; Hohberg, Gerhard; and Greve, Peter, 4,618,759, Cl. 219-121.0LR.

Carley: *See*—
Carley, James A., 4,618,799, Cl. 313-318.000.

Carley, James A., to Carley. Flashlight bulb. 4,618,799, Cl. 313-318.000.

Carney, Scott N.: *See*—
Linder, Donald L.; and Carney, Scott N., 4,618,941, Cl. 364-724.000.

Carpano & Pons: *See*—
Saligny, Yves, 4,618,204, Cl. 339-99.00R.

Carpenter, Francis W., III: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; and Beeland, William D., 4,617,862, Cl. 100-53.000.

Carrell, Ross M.; and Whitley, George J., to RCA Corporation. Insulation displacement terminal wire insertion tool and method. 4,617,731, Cl. 29-861.000.

Carsalade, Charles. Device for facilitating the practice of downhill skiing. 4,617,920, Cl. 128-80.00C.

Carter, Thurman B.; Reynolds, Carl D.; and Mundorf, Larry R., to Homco International Inc. Reaming tool. 4,618,009, Cl. 175-267.000.

Cartmell, James V.; Allaire, Michael J.; and Wolf, Michael L., to NDM Corporation. Medical electrode. 4,617,935, Cl. 128-641.000.

Cartz, Louis: *See*—
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,618,971, Cl. 378-34.000.

Casio Computer Co., Ltd.: *See*—
Sato, Kunio, 4,617,851, Cl. 84-1.190.
Yoshida, Junichi; and Orimoto, Takashi, 4,618,146, Cl. 273-1.00E.

Castaldi, Graziano; and Giordano, Claudio, to Zambon SpA. Process for preparing alpha-arylalkanoic acids. 4,618,697, Cl. 560-56.000.

Castiglioni, Albino. Wire cutting and forming machine with balanced masses. 4,617,819, Cl. 72-407.000.

Castilia S.p.A.: *See*—
Piretti, Giancarlo, 4,618,027, Cl. 182-35.000.

Castro, Horacio. Method and apparatus for decoding audiofrequency information sent through rotary dialing. 4,618,742, Cl. 179-2.00A.

Caterpillar Inc.: *See—*
Garman, James A.; Swift, Stephen D.; Livesay, Richard E.; and Arians, Arlyn J., 4,618,190, Cl. 305-39.000.
Cattano, John D.: *See—*
Simonton, Robert D.; Cattano, John D.; and Mason, Robert K., 4,618,546, Cl. 429-133.000.
Cavallaro, Anthony, to Eastman Kodak Company. High contrast photographic elements exhibiting reduced pepper fog. 4,618,574, Cl. 430-567.000.
Cedrone, Nicholas J.; and Lee, Kenneth R., to Daymarc Corporation. Automatic feed apparatus and process for integrated circuits stored in tubes. 4,618,305, Cl. 414-403.000.
Celes Optical S.r.l.: *See—*
Sartor, Rino; and Bottega, Giampietro, 4,618,226, Cl. 351-113.000.
Celez, Remy. Water sliders. 4,618,329, Cl. 441-76.000.
Celnik, Jean, to Automobiles Citroen; and Automobiles Peugeot. Process for manufacturing miniaturized electronic power circuits. 4,617,729, Cl. 29-840.000.
Central Illinois Manufacturing Co.: *See—*
Ayers, William R., 4,618,388, Cl. 156-284.000.
Central Sprinkler Corporation: *See—*
Hoening, Brian T., 4,618,001, Cl. 169-23.000.
Centre National de la Rechereche Scientifique: *See—*
Pradere, Francois; and Frey, Robert, 4,618,783, Cl. 307-426.000.
Cerline Ceramic Corporation: *See—*
Davis, Thomas E., 4,617,822, Cl. 73-40.50R.
Cha, Charles Y.; Varsanik, Richard G.; and Chen, Shih-Ruey T., to Calgon Corporation. Carboxylic/sulfonic/polyalkylene oxide polymer for use as scale, corrosion, and iron oxide deposit control. 4,618,448, Cl. 252-180.000.
Chadwick, Curt H.: *See—*
Sandland, Paul; Chadwick, Curt H.; Singleton, Russell M.; and Dwyer, Howard, 4,618,938, Cl. 364-552.000.
Chahal, Maninderpal S.: *See—*
Therrien, Roger H.; and Chahal, Maninderpal S., 4,618,254, Cl. 355-68.000.
Chamberlain, Craig S.; Vesley, George F.; Zimmerman, Patrick G.; and McAllister, Jerome W., to Minnesota Mining and Manufacturing Company. Coated glass microbubbles and article incorporating them. 4,618,525, Cl. 428-209.000.
Chambers, George: *See—*
Hall, Kenneth F.; and Chambers, George, 4,617,833, Cl. 74-110.000.
Champion International Corporation: *See—*
Oldham, Steve A.; and Picotte, Ronald T., 4,618,341, Cl. 493-14.000.
Chan, Teh-sheng, to Board of Regents, The University of Texas System. Hybridoma cell lines producing monoclonal antibodies directed against cervical cancer cells. 4,618,585, Cl. 435-240.000.
Chang, Biau-hung: *See—*
Grimm, Robert A.; Kyung, Jai H.; Brusky, Phyllis L.; Holehouse, Joseph G.; and Chang, Biau-hung, 4,618,707, Cl. 560-337.000.
Chappell, Barbara A.; Rajeevakumar, Thekkemadathil V.; Schuster, Stanley E.; and Terman, Lewis M., to International Business Machines Corporation. High-performance, high-density CMOS decoder/driver circuit. 4,618,784, Cl. 307-449.000.
Charette, Joseph G.: *See—*
Hedger, James E., Jr.; and Charette, Joseph G., 4,618,098, Cl. 239-290.000.
Chazee, Jean-Jacques: *See—*
Blandenet, Gerard; Chazee, Jean-Jacques; and Court, Michel, 4,618,508, Cl. 427-57.000.
Chazot, Guy; and Suck, Catherine, to 501 Societe Civile de Recherches et d'Etudes Theraputiques. Medicaments based on zinc gluconate useful for the treatment of hyperprolactinaemias. 4,618,601, Cl. 514-23.000.
Chemische Fabrik Stockhausen GmbH: *See—*
Hartan, Hans-Georg; Padberg, Werner; and Muller, Dietrich, 4,618,414, Cl. 209-5.000.
Chemische Werke Huls Aktiengesellschaft: *See—*
Rigler, Josef K.; and Leithauser, Horst, 4,618,468, Cl. 264-53.000.
Chen, John Y., to Applied Elastomerics, Incorporated. Gelatinous elastomeric optical lens, light pipe, comprising a specific block copolymer and an oil plasticizer. 4,618,213, Cl. 350-96.340.
Chen, Shih-Ruey T.: *See—*
Cha, Charles Y.; Varsanik, Richard G.; and Chen, Shih-Ruey T., 4,618,448, Cl. 252-180.000.
Chen, Shu P.: *See—*
Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; Oltmann, Harold D.; and Chen, Shu P., 4,618,528, Cl. 428-216.000.
Chen, Timothy S.: *See—*
Parker, John A.; Heimbuch, Alvin H.; Hsu, Ming-ta S.; and Chen, Timothy S., 4,618,652, Cl. 525-282.000.
Cherrington, Martin D. Vertical drilling method and apparatus. 4,618,008, Cl. 175-65.000.
Chester, Arthur W.; Garwood, William E.; and Tabak, Samuel A., to Mobil Oil Corporation. Peroxide-induced polymerization of MOGD liquids to high viscosity lubes. 4,618,737, Cl. 585-329.000.
Cheung, George F.: *See—*
Lee, Peter; Cheung, George F.; and Yee, Joe T., 4,618,917, Cl. 362-88.000.
Chevron Research Company: *See—*
Eidem, Penny K., 4,618,373, Cl. 106-273.00R.
Goodrich, Judson E., 4,618,372, Cl. 106-273.00R.
Chi, Hsin-Hsiung. Swimming glove. 4,618,328, Cl. 441-57.000.
Chicago Lock Co.: *See—*
Christopher, Walter S.; Kriskovich, Robert T.; and Steinbach, Robert L., 4,617,813, Cl. 70-394.000.
Chikatani, Hajime; and Kawakami, Sanji, to Kabushiki Kaisha Daisei Kikai. Packaging apparatus. 4,617,785, Cl. 53-562.000.
Chin, Danny: *See—*
Harwood, Leopold A.; Chin, Danny; and Law, Kirk A., 4,618,882, Cl. 358-31.000.
Chiron Corporation: *See—*
Burke, Rae L.; Urdea, Mickey S.; and Valenzuela, Pablo D. T., 4,618,578, Cl. 435-68.000.
Chloride Group Public Limited Company: *See—*
Clegg, Gordon A.; and Jarrett, Phillip, 4,618,545, Cl. 429-130.000.
Chludzinski, George R.: *See—*
Heinzelmann, Fred J.; Rothblatt, Noah S.; Glass, James P., Jr.; Say, Geoffrey R.; Chludzinski, George R.; Sartori, Guido; and Ho, W. S. Winston, 4,618,481, Cl. 423-228.000.
Choay, Patrick: *See—*
Fournier, Jean-Paul; and Choay, Patrick, 4,618,459, Cl. 260-543.00R.
Choay S.A.: *See—*
Fournier, Jean-Paul; and Choay, Patrick, 4,618,459, Cl. 260-543.00R.
Christ, Bruno: *See—*
Stapel, Gunter; Gober, Karl-Heinz; Leyck, Sigurd; Wetzig, Helmut; Birkner, Christian; Kesselring, Kurt; Christ, Bruno; Steiner, Klaus; and Schroder, Friedhelm, 4,618,605, Cl. 514-177.000.
Christopher, Walter S.; Kriskovich, Robert T.; and Steinbach, Robert L., to Chicago Lock Co. Lock-picking tool and method of use thereof. 4,617,813, Cl. 70-394.000.
Chupp, John P.; and Miller, Michael J., to Monsanto Company. Preparation of 2'-methyl-2-haloacetanilides. 4,618,713, Cl. 564-214.000.
Chupp, John P.: *See—*
Alt, Gerhard H.; Chupp, John P.; and Clizbe, Lane A., 4,618,357, Cl. 71-76.000.
Ciba-Geigy Corporation: *See—*
Ackermann, Peter; Gsell, Laurenz; and Kohler, Boris, 4,618,615, Cl. 514-338.000.
Boger, Manfred; and Drabek, Jozef, 4,618,608, Cl. 514-235.000.
Boyer, Stephen K., 4,618,686, Cl. 549-360.000.
Brunner, Hans-Georg, 4,618,360, Cl. 71-88.000.
Demmer, Christopher G.; and Irving, Edward, 4,618,564, Cl. 430-270.000.
Dexter, Martin; and Winter, Roland A. E., 4,618,638, Cl. 524-208.000.
Gass, Karl; Fory, Werner; Meyer. Willy; and Topfl, Werner, 4,618,363, Cl. 71-90.000.
Gubler, Erich; and Siegrist, Max, 4,618,700, Cl. 560-67.000.
Maier, Ludwig, 4,618,358, Cl. 71-86.000.
Moser, Hans, 4,618,361, Cl. 71-88.000.
Sartori, Vittore, 4,618,721, Cl. 568-23.000.
Steinberg, David H.; Luzzi, John J.; and Cortolano, Frank P., 4,618,440, Cl. 252-48.200.
Stockinger, Friedrich; Lohse, Friedrich; and Moser, Roland, 4,618,712, Cl. 564-103.000.
Ciba-Geigy S.p.A.: *See—*
Cantatore, Giuseppe; and Borzatta, Valerio, 4,618,634, Cl. 524-97.000.
Cichanowski, Stanley W.; and Shaw, David G., to SFE Technologies. End termination for chip capacitor. 4,618,911, Cl. 361-308.000.
Cincinnati Electronics Corporation: *See—*
Stepp, Elvin D.; and Claypoole, Gary L., 4,618,966, Cl. 375-62.000.
Claisen, Silvano, to Perros Industriale S.p.A. Foaming system in particular for foaming refrigerator furniture. 4,618,321, Cl. 425-88.000.
Clarion Co., Ltd.: *See—*
Mori, Masaharu; and Asai, Ryuichi, 4,618,830, Cl. 329-105.000.
Clark, Robert W., Jr. Thermally powered engine. 4,617,801, Cl. 62-116.000.
Clarke, Mary A. Chin support belt. 4,617,947, Cl. 132-1.00R.
Claypoole, Gary L.: *See—*
Stepp, Elvin D.; and Claypoole, Gary L., 4,618,966, Cl. 375-62.000.
Clegg, Gordon A.; and Jarrett, Phillip, to Chloride Group Public Limited Company. Recombination electric storage cells. 4,618,545, Cl. 429-130.000.
Cline, David J. Environmentally sealed piezoelectric sensing assembly for electrical switch. 4,618,797, Cl. 310-339.000.
Clizbe, Lane A.: *See—*
Alt, Gerhard H.; Chupp, John P.; and Clizbe, Lane A., 4,618,357, Cl. 71-76.000.
Clusener, Gerhard R. Dilatometer housing. 4,618,274, Cl. 374-208.000.
Cochran, James A., to Burlington Industries, Inc. Divider for separating stacked articles. 4,618,059, Cl. 206-392.000.
Coffey, Charles W.: *See—*
Smith, Stanford L.; Wang, Paul C.; and Coffey, Charles W., 4,618,826, Cl. 324-308.000.
Cofimco S.r.l.: *See—*
Mosiewicz, Antonio, 4,618,313, Cl. 416-237.000.
Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, to Metropolitan Wire Corporation. Surgical case cart. 4,618,067, Cl. 220-1.500.
Colacello, Michael A.: *See—*
Otto, Jack F.; and Colacello, Michael A., 4,618,355, Cl. 65-36.000.
Coleman, Michael. Sling. 4,617,923, Cl. 128-94.000.
Colgate-Palmolive Company: *See—*
Donohue, John J.; Dunn, William J.; and Rustogi, Kedar N., 4,617,918, Cl. 128-66.000.

Collette, Wayne N.; and Demanche, Donald R., to Continental PET Technologies, Inc. Polyester container with oriented, crystallized thread finish for hot fill applications and method of making same. 4,618,515, Cl. 428-35.000.

Collins, John: *See—*
Young, Hartley F.; and Collins, John, 4,618,093, Cl. 238-283.000.

Collins, John D., to Raytheon Company. Continuous wave radar with ranging capability. 4,618,863, Cl. 342-194.000.

Colmelet, Giorgio, to Novavis Intercontinental, Ltd. Method for production of useful substances from soymeal. 4,618,670, Cl. 530-378.000.

Coltman, Stephen C. W.: *See—*
Eyley, Stephen C.; and Coltman, Stephen C. W., 4,618,715, Cl. 564-414.000.

Columbus, Richard L., to Eastman Kodak Company. Capillary transport device having speed and meniscus control means. 4,618,476, Cl. 422-100.000.

Combustion Engineering, Inc.: *See—*
Brule, James E., 4,618,548, Cl. 429-194.000.

Commissariat a l'Energie Atomique: *See—*
Blandenet, Gerard; Chazee, Jean-Jacques; and Court, Michel, 4,618,508, Cl. 427-57.000.

Compagnie Industrielle de Mecanismes en agregé C.I.M.: *See—*
Rampignon, Marc, 4,618,794, Cl. 310-234.000.

Conax Buffalo Corporation: *See—*
Dale, Steven M.; Lyon, Richard A.; and Schutram, David P., 4,618,198, Cl. 339-60.00M.

Congoleum Corporation: *See—*
Stetson, John R., 4,618,530, Cl. 428-236.000.

Conn, P. Michael, to Duke University. Method of regulating hormone function or release. 4,618,598, Cl. 514-6.000.

Consiglio Nazionale Delle Ricerche: *See—*
Brandi, Gabriella; Koch, Paolo; Maiorana, Stefano; Dalla Croce, Piero; and Baldoli, Clara, 4,618,439, Cl. 252-47.500.

Constructions Soudees du Coteau: *See—*
Cabany, Pierre; Gardette, Andre; Jacquet, Xavier; Tollis, Aurelio; and Tollis, Fernando, 4,618,757, Cl. 219-60.00R.

Conti, Vincent N., to American Safety Closure Corp. Mold for forming plastic cap with perforation about the periphery of the skirt. 4,618,121, Cl. 249-59.000.

Continental PET Technologies, Inc.: *See—*
Collette, Wayne N.; and Demanche, Donald R., 4,618,515, Cl. 428-35.000.

Conway, John J.: *See—*
Sherwood, Duane D.; and Conway, John J., 4,618,111, Cl. 244-158.00R.

Cooper, Gary F.; Edwards, John A.; and Van Horn, Albert R., to Syntex (U.S.A.) Inc. 9-oxo-15α-hydroxy-16-phenoxy and 16-substituted phenoxy 17,18,19,20-tetranorprosta-4,5,13,(E)-trienoates. 4,618,696, Cl. 560-53.000.

Cooper, Glenn D.; Butler, John M., III; Morrison, Darrell R.; Senic, Charles L.; Nilsson, Lennart S.; and Rowe, Charles M., to Westinghouse Electric Corp. Turbine generator stator end winding support assembly with decoupling from the core. 4,618,795, Cl. 310-260.000.

Cooper, Kelvin: *See—*
Richardson, Kenneth; Bass, Robert J.; and Cooper, Kelvin, 4,618,616, Cl. 514-340.000.

Corbet, Jean-Pierre; Cotrel, Claude; Farge, Daniel; and Paris, Jean-Marc, to Rhone-Poulenc Sante. Synergistine derivatives having anti-bacterial activity and their use. 4,618,599, Cl. 514-11.000.

Cornell Research Foundation, Inc.: *See—*
Gettens, John W.; Sigrimis, Nick A.; and Scott, Norman R., 4,618,861, Cl. 340-825.540.
Muller, Robert L.; and Andersen, Olaf S., 4,618,916, Cl. 361-434.000.

Corning Glass Works: *See—*
Palmquist, Ronald W., 4,618,962, Cl. 373-30.000.

Corsette, Douglas F. Liquid dispensing pump. 4,618,077, Cl. 222-383.000.

Cortellucci, Giancarlo, to Studio Tecnico A.C. s.r.l. One piece double shell box with closure fastener. 4,618,090, Cl. 229-45.00R.

Cortolano, Frank P.: *See—*
Steinberg, David H.; Luzzi, John J.; and Cortolano, Frank P., 4,618,440, Cl. 252-48.200.

Cosman, Eric R. Means for localizing target coordinates in a body relative to a guidance system reference frame in any arbitrary plane as viewed by a tomographic image through the body. 4,618,978, Cl. 378-164.000.

Cosson, Keith J., to C. C. Sales Corporation. Ripper implement. 4,618,006, Cl. 172-699.000.

Costinescu-Tataranu, Alexandru B.: *See—*
Gloria, Karl F. L.; Costinescu-Tataranu, Alexandru B.; Schuster, Wilhelm; and Wittekind, Jurgen, 4,618,282, Cl. 405-53.000.

Cotrel, Claude: *See—*
Corbet, Jean-Pierre; Cotrel, Claude; Farge, Daniel; and Paris, Jean-Marc, 4,618,599, Cl. 514-11.000.

Couch, John L.: *See—*
Rand, Roy E.; Mitchell, John W. J.; and Couch, John L., 4,618,970, Cl. 378-10.000.

Couey, H. Melvin; and Hayes, Charles F., to United States of America, Agriculture; and University of Hawaii, The. Quarantine system for papaya. 4,618,497, Cl. 426-233.000.

Cournoyer, Bernard T.: *See—*
Nardella, Michael A.; and Cournoyer, Bernard T., 4,618,118, Cl. 248-243.000.

Court, Michel: *See—*
Blandenet, Gerard; Chazee, Jean-Jacques; and Court, Michel, 4,618,508, Cl. 427-57.000.

Covey, Rupert A.; Forbes, Patricia J.; and Bell, Allyn R., to Uniroyal Chemical Company, Inc. Substituted tetrazolinones and their use as herbicides. 4,618,365, Cl. 71-92.000.

Cramp, Michael C.; Gilmour, James; and Parnell, Edgar W., to May & Baker Limited. Certain N-(2,4-difluorophenyl)-2-(3-trifluoromethylphenoxy)-nicotinamides having herbicidal activity. 4,618,366, Cl. 71-94.000.

Creative Landscape Service, Inc.: *See—*
Pomerenke, David E., 4,617,713, Cl. 29-426.400.

Crosfield Electronics Limited: *See—*
Ross, Peter F.; Rodgers, Ian W.; and Goodings, Rupert L., 4,618,846, Cl. 340-347.0DD.

Cross, Peter E.: *See—*
Alker, David; Campbell, Simon F.; and Cross, Peter E., 4,618,609, Cl. 514-236.000.

Crull, Carroll M.: *See—*
Michel, Dominique; Johnson, Delbert B.; Pages, Jean F.; Foglia, Vincent F. P.; Martin, Jean G. M.; Vache , Michel P.; Sedillot, Francois G.; and Crull, Carroll M., 4,618,286, Cl. 405-208.000.

Cutbush, James D.: *See—*
Pritchett, James D.; and Cutbush, James D., 4,617,807, Cl. 62-399.000.

Cuthbert, Victor W.; and Snider, Joel M., to Whirlpool Corporation. Cabinet construction for an automatic washer. 4,618,193, Cl. 312-264.000.

Cutshall, Robert S., to Omega Castings, Inc. Link conveyor belt for heat treating apparatus. 4,618,056, Cl. 198-853.000.

Cybulski, Laurence P.; and McGlogan, Robert R., to R.R. McGlogan Equipment Ltd. Cylinder head pressure testing apparatus. 4,617,824, Cl. 73-49.700.

Czichy, Reinhard; and Goeschel, Wilhelm, to MBB GmbH. Star and sun sensor for attitude and position control. 4,618,259, Cl. 356-152.000.

Daae-Johansen, Finn: *See—*
Fonne, Gunnar J.; Daae-Johansen, Finn; Thoresen, Per; and Nilsen, Stein-Arne, 4,617,777, Cl. 52-802.000.

Dac-Emballage A.M.B.A.: *See—*
Berthelsen, Ernst R., 4,618,993, Cl. 383-44.000.

Dahlheimer, Peter; and Soyck, Gerno, to Werner Turck GmbH & Co. KG. Inductive proximity switch having an oscillator magnetic core and a permanent magnet forming a saturation-sensitive magnetization area. 4,618,823, Cl. 324-207.000.

Dai, Shenghong A., to Dow Chemical Company, The. Nitro substituted diphenyl ethers. 4,618,727, Cl. 568-585.000.

Daicel Chemical Industries Ltd.: *See—*
Kanematu, Tetuo; and Yamaguchi, Yoshiaki, 4,618,491, Cl. 424-81.000.

Daigle, Chris J.: *See—*
Lamensdorf, David; and Daigle, Chris J., 4,618,865, Cl. 343-776.000.

Daigle, Verlon C., to McDermott International, Inc. Releasable lowering and coupling assembly for pile driving. 4,618,288, Cl. 405-232.000.

Daimler-Benz Aktiengesellschaft: *See—*
Abthoff, Jorg; Schuster, Hans-Dieter; Loose, Gunter; and Ebinger, Gunther, 4,617,795, Cl. 60-276.000.
Weiger, Gunter; Dorrie, Dieter; and Schwerdt, Paul, 4,617,969, Cl. 137-627.500.

Dainippon Screen Mfg. Co.: *See—*
Sakamoto, Takashi, 4,618,883, Cl. 358-78.000.

Dainippon Screen Mfg., Co., Ltd.: *See—*
Miyasaka, Eiji; Hirose, Iwao; Yamashita, Koji; Kawai, Kenji; and Kanada, Eiji, 4,618,255, Cl. 355-71.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Sakamoto, Takashi, 4,618,239, Cl. 354-477.000.

Dale, Jerry D. Tree step. 4,618,028, Cl. 182-92.000.

Dale, Steven M.; Lyon, Richard A.; and Schutram, David P., to Conax Buffalo Corporation. Connector for sealingly joining the ends of a pair of electrical cables. 4,618,198, Cl. 339-60.00M.

Dalla Croce, Piero: *See—*
Brandi, Gabriella; Koch, Paolo; Maiorana, Stefano; Dalla Croce, Piero; and Baldoli, Clara, 4,618,439, Cl. 252-47.500.

Damm, Norbert, to BMD Badische Maschinenfabrik Durlach GmbH. Methods for the compaction of foundry molding material. 4,617,978, Cl. 164-37.000.

D'Amore, Michael B.; and Ellefson, Roger R., to Du Pont de Nemours, E. I., and Company. Manufacture of butanedicarboxylic acid esters. 4,618,702, Cl. 560-204.000.

Dan, Shigeyuki; Ishii, Kazuo; Kato, Eiichi; and Sera, Hidefumi, to Fuji Photo Film Co., Ltd. Liquid developer for electrostatic photography. 4,618,557, Cl. 430-114.000.

Dana-Farber Cancer Institute, Inc.: *See—*
Blattler, Walter A.; Lambert, John M.; and Senter, Peter D., 4,618,492, Cl. 424-85.000.

Daniels, Edward P.; and Rinne, Risto A., Jr., to Pitney Bowes Inc. Watchdog circuit. 4,618,953, Cl. 371-12.000.

Das, Subrata K.; and Dixon, Norman R., to International Business Machines Corporation. Adaptive automatic discrete utterance recognition. 4,618,984, Cl. 381-43.000.

Data General Corporation: *See—*
Bratt, Richard G.; Gruner, Ronald H.; Jones, Thomas M.; and Nealon, James T., 4,618,925, Cl. 364-200.000.

David, Constant V. Moldable handle adapter. 4,617,697, Cl. 16-110.00R.

Davidson, Donald J.: *See—*
Weber, James L.; and Davidson, Donald J., 4,618,034, Cl. 188-73.360.

Davis, James L., to Halliburton Company. Nuclear densometer. 4,618,939, Cl. 364-555.000.

Davis, Thomas E., to Cerline Ceramic Corporation. Tell-tale wear monitor for pipes having wear resistant inner linings. 4,617,822, Cl. 73-40.50R.

Dayco Corporation: *See—*
Miranti, Joseph P., Jr., 4,618,334, Cl. 474-93.000.

Daymarc Corporation: *See—*
Cedrone, Nicholas J.; and Lee, Kenneth R., 4,618,305, Cl. 414-403.000.

De La Rue Systems Limited: *See—*
Huckle, Ralph E., 4,618,070, Cl. 220-350.000.

Deal, James F., III: *See—*
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; and Deal, James F., III, 4,618,348, Cl. 44-51.000.

Deal, Michel. Variable ratio transmission. 4,618,331, Cl. 474-49.000.

DeBernardis, John F.; Kerkman, Daniel J.; and McClellan, William J., to Abbott Laboratories. Tetrahydro-6,7-dimethoxy-1H-benz-[e]isoinodolines useful in the treatment of hypertension and as sedatives. 4,618,683, Cl. 548-420.000.

DEC (Realisations) Limited: *See—*
Bishop, Thomas D., 4,617,850, Cl. 83-324.000.

Defaucheux, Jacques B.; and Guedj, Freddy, to Jeumont-Schneider; and Framatone. Electromagnetic safety device of a screw/nut type. 4,618,471, Cl. 376-228.000.

DeGeeter, Melvin J.; Lanza, Gregory M.; and Vineyard, Billy D., to Monsanto Company. Composition and method for improving feed utilization or tissue production in animals. 4,618,604, Cl. 514-130.000.

Degnan, Thomas F., Jr.: *See—*
Brinckman, Frederick E.; Degnan, Thomas F., Jr.; and Weiss, Carl S., 4,618,410, Cl. 208-97.000.

Deguchi, Naoyasu: *See—*
Ichijima, Seiji; Usui, Hideo; and Deguchi, Naoyasu, 4,618,571, Cl. 430-505.000.

Degussa Aktiengesellschaft: *See—*
Drauz, Karlheinz; and Kleemann, Axel, 4,618,730, Cl. 568-771.000.

Dehm, David C.; and Lawson, H. Franklin, to Atlantic Richfield Company. Process for preparation of polymers containing dicarboxylic acid cyclic imide units in a solid/liquid slurry. 4,618,655, Cl. 525-344.000.

Dehm, David C.: *See—*
Thanawalla, Chandrakant B.; and Dehm, David C., 4,618,703, Cl. 560-209.000.

Delgoffe, Jean-Claude; Lobmann, Michele; and Zygraich, Nathan, to SmithKline-RIT. Temperature sensitive strains of bovine viral diarrhoea virus, preparation thereof and vaccines containing them. 4,618,493, Cl. 424-89.000.

Dellian, Kurt A. Red-1-(cyanophenylazo- or cyano, halophenylazo)-2-amino-8-hydroxynaphthalene-6 sulfonic acid dyestuffs. 4,618,674, Cl. 534-878.000.

Demanche, Donald R.: *See—*
Collette, Wayne N.; and Demanche, Donald R., 4,618,515, Cl. 428-35.000.

De Marco, Peter T. Method of treatment of animal and human tissues damaged by burns and frank visible gangrene. 4,618,490, Cl. 424-80.000.

Demmer, Christopher G.; and Irving, Edward, to Ciba-Geigy Corporation. Process for production of positive images using sulfonic acid precursors. 4,618,564, Cl. 430-270.000.

Denk, Joseph, to Garrett Corporation, The. Maximum stiffness permanent magnet rotor and construction method. 4,617,726, Cl. 29-598.000.

Denomey, Ernest A. Folding table, workbench or the like. 4,617,869, Cl. 108-132.000.

Dent, John C., to National Research Development Corporation. Pistons for internal combustion engines. 4,617,888, Cl. 123-307.000.

Dentalvarutjanst AB: *See—*
Andersson, Eilert, 4,617,718, Cl. 29-558.000.

DePasquale, Ralph J.; Evans, James M.; and Kremer, Paul W., to SCM Corporation. Silane compositions. 4,618,688, Cl. 556-419.000.

Dereu, Norbert; Welter, Andre ; Wendel, Albrecht; Leyck, Sigurd; Parnham, Michael; Graf, Erich; Sies, Helmut; Betzing, Hans; and Fischer, Hartmut, to A. Nattermann & Cie GmbH. S-(carbamoylphenylselenyl) derivatives of glutathione and of aminomercaptocarboxylic acids. 4,618,669, Cl. 530-331.000.

Desbois, Michel, to Rhone-Poulenc Specialites Chimiques. Process for the preparation of benzophenones. 4,618,726, Cl. 568-322.000.

Deschner, Robert P.: *See—*
Siddoway, Mark A.; Salter, James A.; and Deschner, Robert P., 4,617,744, Cl. 34-168.000.

DeSoto, Inc.: *See—*
Katchko, John; Plaisance, Thomas H.; and Kriz, Karel, 4,618,657, Cl. 525-443.000.

Deutsche Post, Rundfunk-und Fernsehtechnisches Zentralamt: *See—*
Steinke, Gerhard; Fels, Peter; Hoeg, Wolfgang; Lorenz, Werner; Ahnert, Wolfgang; Steffen, Frank; and Reichardt, Walter, 4,618,987, Cl. 381-82.000.

Develco, Inc.: *See—*
More, Henry S., 4,617,960, Cl. 137-554.000.

Devlin, John P.: *See—*
Hargrave, Karl D.; Devlin, John P.; and Barsumian, Edward A., 4,618,677, Cl. 544-400.000.

Dexter, Martin; and Winter, Roland A. E., to Ciba-Geigy Corporation. Compositions containing alpha-cyanocinnamate ultraviolet-absorbing stabilizers substituted by an aliphatic hydroxyl group. 4,618,638, Cl. 524-208.000.

Dickakian, Ghazi B., to Exxon Chemical Patents Inc. Additive combination and method for using it to inhibit deposit formation. 4,618,411, Cl. 208-48.0AA.

Diederich, Paul W., Jr. Tie mount. 4,617,702, Cl. 24-16.0PB.

Diesel GmbH & Company: *See—*
Gronke, Helmut, 4,617,827, Cl. 73-200.000.

Diesel Kiki Co., Ltd.: *See—*
Hirano, Yutaka; Inoue, Kazuo; and Yasuhara, Seishi, 4,617,902, Cl. 123-501.000.
Suzuki, Shoichi; and Keiichi, Yamada, 4,617,793, Cl. 60-285.000.

Dietz, Richard E., to Phillips Petrolem Company. Polymerization of olefins. 4,618,595, Cl. 502-108.000.

Digmayer, Michael: *See—*
Bohme, Klaus; Beyer, Wolfgang; Seibt, Gunter; and Digmayer, Michael, 4,618,749, Cl. 200-144.00B.

Dilcher, Dietmar, to Gebr. Bode & Co. GmbH. Swingable sliding door for a motor vehicle utilizing a swing arm mounted on the body of the car. 4,617,756, Cl. 49-212.000.

Dimey, Marcel: *See—*
Schwob, Pierre; and Dimey, Marcel, 4,618,746, Cl. 200-61.45R.

D'Intino, Adamo M.: *See—*
Fish, Aaron M.; D'Intino, Adamo M.; Moessner, Frank G.; and Mazoff, Stanley S., 4,617,810, Cl. 70-14.000.

Disco Co., Ltd.: *See—*
Sekiya, Shinji; and Ono, Takatoshi, 4,617,766, Cl. 51-209.00R.

Ditcher, Jack, to A-Lok Products, Incorporated. Precast concrete manhole adjustable bolt slot for securing cast iron frame and cover and method for casting same. 4,618,464, Cl. 264-35.000.

Dixon, Norman R.: *See—*
Das, Subrata K.; and Dixon, Norman R., 4,618,984, Cl. 381-43.000.

Dobson Park Industries Plc.: *See—*
Petts, Nigel J.; and Marsh, John, 4,617,954, Cl. 137-110.000.

Dr. Ing. Rudolf Hell GmbH: *See—*
Pointner, Martin; and Sommer, Rudiger, 4,617,727, Cl. 29-825.000.

Dr. Johannes Heidenhain GmbH: *See—*
Schmitt, Walter, 4,618,940, Cl. 364-560.000.

Dr. Miller's Health Care Products, Inc.: *See—*
Miller, Griffith C., 4,617,917, Cl. 128-62.00R.

Domenico, Samuel N., to Amoco Corporation. Moving seismic source system for use in water-covered areas. 4,618,024, Cl. 181-120.000.

Donner, Bernd; Schultze, Hartmut; and Jahnig, Lutz, to Mannesmann Kienzle GmbH. Speed limiting system for a motor vehicle including a switch and a method for positioning the switch. 4,617,893, Cl. 123-361.000.

Donofrio, Robert L.; and Puhak, Peter G., to North American Philips Consumer Electronics Corp. Cathode ray tube base. 4,618,206, Cl. 339-144.00T.

Donohue, John J.; Dunn, William J.; and Rustogi, Kedar N., to Colgate-Palmolive Company. Device for combined therapeutic and stimulative treatment of the gums. 4,617,918, Cl. 128-66.000

Dopyera, Emil E.; and Miller, Jack E., to Big-Inch Marine Systems, Inc. Swivel coupling element. 4,618,173, Cl. 285-261.000.

Doraivelu, Sokka M.: *See—*
Gegel, Harold L.; Malas, James C.; Prasad, Yellapregada V. R. K.; Doraivelu, Sokka M.; Barker, Douglas R.; Morgan, James T., Jr.; and Lark, Kristine A., 4,617,817, Cl. 72-364.000.

Dore, Jacky, to Sandoz Ltd. Salts of the 1:2 chromium complex of 4-(5'-chloro-2'-hydroxy-3'-sulfophenylazo)-3-methyl-1-phenylpyrazol-5-one and 4-(3', 5'-dichloro-2'-hydroxyphenylazo)-3-methyl-1-phenylpyrazol-5-one. 4,618,673, Cl. 534-698.000.

Doremus, Michael G.: *See—*
Robison, Robert S.; and Doremus, Michael G., 4,618,583, Cl. 435-146.000.

Dorrie, Dieter: *See—*
Weiger, Gunter; Dorrie, Dieter; and Schwerdt, Paul, 4,617,969, Cl. 137-627.500.

Dorsch, William J., to Liftomatic Material Handling Co., Inc. Self contained drum dumper for fork trucks. 4,618,306, Cl. 414-420.000.

Dory, Jacques. Ultrasonic pulse apparatus for destroying calculuses. 4,617,931, Cl. 128-328.000.

Doutsubo, Nobuhide, to Sanyo Electric Co., Ltd. Record mode discrimination circuit. 4,618,899, Cl. 360-73.000.

Dover Corporation: *See—*
Fahl, Richard L., 4,618,171, Cl. 285-93.000.

Dow Chemical Company, The: *See—*
Bergman, Roger W.; and Smith, Harry A., 4,618,461, Cl. 558-234.000.
Berman, Jody R.; Steele, Dennis L.; and Kubisiak, Michael P., 4,618,526, Cl. 428-209.000.
Dai, Shenghong A., 4,618,727, Cl. 568-585.000.
Ellebracht, Stephen R., 4,617,828, Cl. 73-866.000.
Hefner, Robert E., Jr.; and Messick, Virginia B., 4,618,658, Cl. 525-454.000.
Knobel, Thomas M.; Kennedy, Earl E.; and Walker, Mary A., 4,618,630, Cl. 521-105.000.
Silvenis, Scott A., 4,618,076, Cl. 222-331.000.

Dow Corning Corporation: *See—*
Bauman, Therese M.; and Huebner, David J., 4,618,645, Cl. 524-745.000.
Braun, Joseph T.; and Smith, Schuyler B., 4,618,665, Cl. 528-25.000.
Schoenherr, Christine J., 4,618,642, Cl. 524-425.000.

Dowbenko, Rostyslaw: *See—*
Kania, Charles M.; and Dowbenko, Rostyslaw, 4,618,659, Cl. 525-455.000.

Doyen, Rene H., to Mobil Oil Corporation. Good machineability film structure. 4,618,527, Cl. 428-213.000.

Drabek, Jozef: *See—*
Boger, Manfred; and Drabek, Jozef, 4,618,608, Cl. 514-235.000.

Dragerwerk AG: *See—*
Heim, Ulrich; and Gebhardt, Peter, 4,617,924, Cl. 128-204.230.

Drake, Charles A., to Phillips Petroleum Company. Preparation of organic sulfides. 4,618,722, Cl. 568-59.000.

Drake, Kenneth: *See—*
Osborn, Claiborn L.; Koleske, Joseph V.; and Drake, Kenneth, 4,618,635, Cl. 524-113.000.

Drauz, Karlheinz; and Kleemann, Axel, to Degussa Aktiengesellschaft. Process for the production of pyrocatechol and hydroquinone. 4,618,730, Cl. 568-771.000.

Drew, John: *See—*
Young, Mark S.; Drew, John; Shebanow, Michael C.; and Dujari, Vineet, 4,618,898, Cl. 360-51.000.

Drlik, Gunther, to Obe-Werk Ohnmacht & Baumgartner GmbH & Co. K.G. Spring-biased hinge assembly for spectacles. 4,617,698, Cl. 16-228.000.

Drukier, Andrej K. Apparatus for the diagnosis of body structures into which a gammaemitting radioactive isotope has been introduced. 4,618,773, Cl. 250-363.00S.

Dubois, Harvey W.; and Heselton, Fred, to Dubois, Harvey W.; and Provost, R. J., part interest to each. Low D.C. and loss of A.C. sensor and alarm with service inhibitor. 4,618,857, Cl. 340-654.000.

DuBois, Mark; Theeuwes, Felix; and Wong, Patrick S. L., to ALZA Corporation. Device for administering calcium ascorbate. 4,618,487, Cl 424-15.000.

Duff, James M.: *See—*
Stolka, Milan; Pai, Damodar M.; Smith, Thomas W.; Duff, James M.; and Loutfy, Rafik O., 4,618,551, Cl. 430-58.000.

Duggan, D. Michael; Lyons, James E.; and Myers, Harry K., Jr., to Sun Refining and Marketing Company. Ruthenium-cobalt carbonyl metal cluster catalysts for the dealkoxyhydroxymethylation of acetals to form glycol ethers. 4,618,729, Cl. 568-678.000.

Dugge, Richard H.; and Holt, Jan D., to ACF Industries, Incorporated. Plenum chamber flow restrictor and check valve. 4,618,295, Cl. 406-138.000.

Duhon, Phil J.: *See—*
Favret, Uncas B., Jr.; and Duhon, Phil J., 4,618,430, Cl. 210-703.000.

Dujari, Vineet: *See—*
Young, Mark S.; Drew, John; Shebanow, Michael C.; and Dujari, Vineet, 4,618,898, Cl. 360-51.000.

Duke, James P. Power operated door opener lock system. 4,618,174, Cl. 292-135.000.

Duke University: *See—*
Conn, P. Michael, 4,618,598, Cl. 514-6.000.

Dunn, William J.: *See—*
Donohue, John J.; Dunn, William J.; and Rustogi, Kedar N., 4,617,918, Cl. 128-66.000.

Du Pont de Nemours, E. I., and Company: *See—*
Beck, Leonard H., 4,618,731, Cl. 568-842.000.
D'Amore, Michael B.; and Ellefson, Roger R., 4,618,702, Cl. 560-204.000.
Elias, John G.; and Jansson, Peter A., 4,618,937, Cl. 364-518.000.
Libregts, Hubertus B.; and van Nes, Cornelis G. J., 4,618,202, Cl. 339-99.00R.
Marcus, Ilan, 4,618,531, Cl. 428-283.000.
Nozaki, Hitosi; and Oshima, Koichiro, 4,618,724, Cl. 568-311.000.
Putzig, Donald E., 4,618,435, Cl. 252-8.551.
Townsend, Peter K., 4,618,201, Cl. 339-99.00R.

Duracell Inc.: *See—*
Markin, Charles, 4,618,547, Cl. 429-174.000.

Durrett, Van D.: *See—*
Allen, Charles A.; and Durrett, Van D., 4,617,884, Cl. 123-192.00R.

Dwiggins, Bruce L.; Pickens, Carl E.; and Niekamp, Carl W., to Genencor, Inc. Raw starch saccharification. 4,618,579, Cl. 435-96.000.

Dwyer, Howard: *See—*
Sandland, Paul; Chadwick, Curt H.; Singleton, Russell M.; and Dwyer, Howard, 4,618,938, Cl. 364-552.000.

E. R. Squibb & Sons, Inc.: *See—*
Robison, Robert S.; and Doremus, Michael G., 4,618,583, Cl. 435-146.000.

Eagle Electric Mfg. Co., Inc.: *See—*
Leopold, Howard S., 4,618,907, Cl. 361-45.000.

Eastern Company, The: *See—*
Wright, Raymond L., 4,618,291, Cl. 405-261.000.

Eastman Kodak Company: *See—*
Borsenberger, Paul M.; Regan, Michael T.; and Staudenmayer, William J., 4,618,560, Cl. 430-130.000.
Cavallaro, Anthony, 4,618,574, Cl. 430-567.000.
Columbus, Richard L., 4,618,476, Cl. 422-100.000.
Minor, James C., 4,618,249, Cl. 355-14.0CH.

Eaton Corporation: *See—*
Bartolomeo, Mark E., 4,618,256, Cl. 356-23.000.
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,618,971, Cl. 378-34.000.

Ebara Corporation: *See—*
Fujimoto, Masakazu; and Inoue, Naoyuki, 4,617,987, Cl. 165-95.000.

Ebel, Klaus; and Reuther, Wolfgang, to BASF Aktiengesellschaft. Preparation of N,N',N''-tris-2-hydroxypropyl)-melamine. 4,618,676, Cl. 544-196.000.

Ebinger, Gunther: *See—*
Abthoff, Jorg; Schuster, Hans-Dieter; Loose, Gunter; and Ebinger, Gunther, 4,617,795, Cl. 60-276.000.

Echeverria, Julio A.: *See—*
Heyde, Hans H.; and Echeverria, Julio A., 4,618,753, Cl. 200-148.00G.

Echte, Adolf: *See—*
Muench, Volker; Hambrecht, Juergen; Naarmann, Herbert; Echte, Adolf; and Illers, Karl H., 4,618,636, Cl. 524-176.000.
Muench, Volker; Hambrecht, Juergen; Himmele, Walter; Echte, Adolf; and Swoboda, Johann, 4,618,668, Cl. 528-215.000.
Taubitz, Christof; Muench, Volker; Hambrecht, Juergen; Echte, Adolf; and Illers, Karl H., 4,618,633, Cl. 524-80.000.

Eckle, Otto; and Veigel, Helmut, to Komet Stahlhalter- und Werkzeugfabrik Robert Bruning, GmbH. Turret head for a lathe and a tool holder suitable for use therewith. 4,617,848, Cl. 82-36.00A.

Ecklund, Lawrence M., to Motorola, Inc. Tone detector with pseudo phase locked loop. 4,618,981, Cl. 381-15.000.

Ecoplastics Limited: *See—*
Guillet, James E.; and Redpath, Anthony E., 4,618,566, Cl. 430-271.000.

Eddington, Donald K., to University of Utah, The. Artificial hearing device and method. 4,617,913, Cl. 128-1.00R.

Edelmann, Ludwig: *See—*
Brandenstein, Manfred; Haas, Roland; Herrmann, Gerhard; Friedrich, Wolfgang; and Edelmann, Ludwig, 4,618,335, Cl. 474-112.000.

Edling, Theodore L. Belt driven knife sharpener. 4,617,763, Cl. 51-135.00R.

Edwards, John A.: *See—*
Cooper, Gary F.; Edwards, John A.; and Van Horn, Albert R., 4,618,696, Cl. 560-53.000.

Edwards, Thomas C. Oil separation system using superheat. 4,617,808, Cl. 62-472.000.

EGA Limited: *See—*
Bramwell, David W., 4,618,741, Cl. 174-68.00C.

Egami, Shunichiro; and Kawai, Makoto, to Nippon Telegraph & Telephone Corporation. Power amplifying apparatus. 4,618,831, Cl. 330-124.00R.

Eguchi, Chikahiko: *See—*
Ozawa, Yoichi; Kishimoto, Shinichi; Shinohara, Emiko; Takemoto, Tadashi; and Eguchi, Chikahiko, 4,618,695, Cl. 560-41.000.

Eguchi, Jutaro; Odahara, Tetsuichi; and Sukenari, Junzo, to Kubota, Ltd. Combine harvester machine. 4,617,787, Cl. 56-14.600.

Egyt Gyogyszervegyeszeti Gyar: *See—*
Budai, Zoltan; Benko, Pal; Ratz nee Simonek, Ildiko ; Rakoczy nee Pinter, Eva; Magyar, Karoly; Kelemen, Jozsef; and Mandi, Attila, 4,618,623, Cl. 514-478.000.

Eidem, Penny K., to Chevron Research Company. Air-blowing asphalt using hydrohalic acid catalysts. 4,618,373, Cl. 106-273.00R.

Eisenberg, Philip H., to Northrop Corporation. Protective structure and method for working on sensitive electronic devices. 4,618,222, Cl. 350-582.000.

Ektelon: *See—*
Mortvedt, Raymond L.; and Thompson, Steven M., 4,618,148, Cl. 273-73.00C.

Electric Power Research Institute: *See—*
Kinnan, Frank, 4,618,287, Cl. 405-232.000.

Electrolux Constructor Aktiebolag: *See—*
Viklund, Ake E., 4,618,064, Cl. 211-192.000.

Elias, John G.; and Jansson, Peter A., to Du Pont de Nemours, E. I., and Company. Spot quantitation. 4,618,937, Cl. 364-518.000.

Elkins, Bobby R.: *See—*
Keller, Vernon W.; Owen, Robert B.; Elkins, Bobby R.; and White, William T., 4,618,215, Cl. 350-319.000.

Elks, William J. Multi-modal proximity sensor system. 4,618,845, Cl. 340-61.000.

Ellebracht, Stephen R., to Dow Chemical Company, The. Method and apparatus for determining the solubility of volatile materials in non-volatile materials. 4,617,828, Cl. 73-866.000.

Ellefson, Roger R.: *See—*
D'Amore, Michael B.; and Ellefson, Roger R., 4,618,702, Cl. 560-204.000.

Elliott, Arthur J.; and Astrologes, Gary W., to Halocarbon Products Corporation. Preparation of trifluoroethylamine. 4,618,718, Cl. 564-481.000.

Elliott, Gary K.: *See—*
Barnes, Andrew; Elliott, Gary K.; MacFarlane, William; and Pheasant, Stephen T., 4,618,079, Cl. 222-591.000.

Elliott, Robert. Liquid end for a reciprocating pump having easily removable valves and valve retainers. 4,618,316, Cl. 417-454.000.

Emerson Electric Company: *See—*
Hagerman, James E.; Mathewes, William D.; Rees, Fenton L.; and Flack, Albert J., 4,618,810, Cl. 318-803.000.

Emhart Corporation: *See—*
Bond, Michael E.; and Noll, Robert S., 4,617,692, Cl. 7-158.000.

Emhart Industries, Inc.: *See—*
Hirt, Walter; and Futterknecht, Fritz, 4,618,356, Cl. 65-173.000.

Emi, Kenji: *See—*
Fukushima, Toshihiko; Miyamoto, Seigo; Sayo, Kosaku; and Emi, Kenji, 4,617,804, Cl. 62-212.000.

Emonts, Heinfried; and Gebhardt, Franz, to Saint-Gobain Vitrage. Colored enamel composition for obtaining decorative layers of float glass sheets. 4,618,538, Cl. 428-428.000.

Endo, Keiji: *See—*
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,618,914, Cl. 361-315.000.

Endo, Teiichi: *See—*
Mizukoshi, Masataka; and Endo, Teiichi, 4,618,879, Cl. 357-74.000.

Endotronics, Inc.: *See—*
Walker, Robert D., 4,618,586, Cl. 435-1.000.

Endroczi, Gabor: *See—*
Pal, Gabor; Endroczi, Gabor; Hollos, Gyorgy; Nagy, Gabor; Szonyi, Gabor; Bodi Laszlo ; and Balazs, Zoltan, 4,617,830, Cl. 73-590.000.

Engelskirchen, Konrad; Stein, Werner; Bahn, Michael; Schieferstein, Ludwig; Schindler, Joachim; and Schmid, Rolf, to Henkel Kommanditgesellschaft auf Aktien. Process for producing Xanthomonas biopolymers. 4,618,582, Cl. 435-104.000.

Engetra S.A.: *See—*
Paquet, Andre J., 4,617,878, Cl. 122-422.000.

Engineering Specialties, Inc.: *See—*
Favret, Uncas B., Jr.; and Duhon, Phil J., 4,618,430, Cl. 210-703.000.

Enichem Polimeri, S.p.A.: *See—*
Roggero, Arnaldo; and Bruzzone, Mario, 4,618,449, Cl. 252-182.000.

Ens, John; McEwen, James A.; and Beattie, Craig W., to Vancouver General Hospital. Visual stimulator. 4,618,230, Cl. 351-221.000.

Erskine, James C., Jr.: *See—*
MacIver, Bernard A.; Erskine, James C., Jr.; and Bierlein, John C., 4,618,505, Cl. 427-38.000.

Esper, Friedrich; and Frey, Thomas, to Robert Bosch GmbH. Device for cleaning of gases. 4,618,351, Cl. 55-146.000.

Esselborn, Eberhard; and Fock, Jurgen, to Th. Goldschmidt AG. Sulfonated polyoxyalkylene ethers of 1,2 or 1,3-diols, their preparation and use. 4,618,457, Cl. 260-504.00R.

Esselte Pendaflex Corporation: *See—*
Volk, Heinrich, 4,618,393, Cl. 156-384.000.

Eto, Takehiko: *See—*
Miyagi, Yoshimitsu; Hino, Mitsuo; and Eto, Takehiko, 4,618,382, Cl. 148-415.000.

Evans, James M.: *See—*
DePasquale, Ralph J.; Evans, James M.; and Kremer, Paul W., 4,618,688, Cl. 556-419.000.

Evans, Terence J.: *See—*
Wehr, Eugene W.; Oster, Clark L.; and Evans, Terence J., 4,618,751, Cl. 200-144.00R.

Excelermatic Inc.: *See—*
Kraus, Charles E., 4,618,270, Cl. 384-114.000.

Experimentalny Nauchno-Issledovatelsky Institut Metallorezhuschikh Stankov: *See—*
Reibakh, Judel S., 4,617,764, Cl. 51-165.710.

Exxon Chemical Patents Inc.: *See—*
Agapiou, Agapios K.; Muhle, Michael E.; and Kurtzman, Myron B., 4,618,596, Cl. 502-116.000.
Dickakian, Ghazi B., 4,618,411, Cl. 208-48.0AA.

Exxon Research and Engineering Company: *See—*
Fiato, Rocco A.; and Soled, Stuart L., 4,618,597, Cl. 502-324.000.
Graves, Victoria, 4,618,660, Cl. 526-114.000.
Heinzelmann, Fred J.; Rothblatt, Noah S.; Glass, James P., Jr.; Say, Geoffrey R.; Chludzinski, George R.; Sartori, Guido; and Ho, W. S. Winston, 4,618,481, Cl. 423-228.000.
Hudson, Carl W.; and Hamner, Glen P., 4,618,412, Cl. 208-59.000.
Michelson, Herbert D., 4,618,310, Cl. 415-1.000.
Mintz, Donald J.; and Gleason, Anthony M., 4,618,432, Cl. 210-748.000.
Overfield, Robert E., 4,618,413, Cl. 208-251.00R.
Prillieux, Marcel; Laurent, Robert M.; and Tirtiaux, Robert, 4,618,458, Cl. 260-505.00P.

Eyley, Stephen C.; and Coltman, Stephen C. W., to Fisons Limited. Production of oxygen and nitrogen substituted benzenes. 4,618,715, Cl. 564-414.000.

Eysholdt, Ursula: *See—*
Sturm, Walter; Becker, Helmut; Witt, Jurgen; Fritz, Werner; and Eysholdt, Ursula, 4,618,776, Cl. 250-372.000.

Fadner, Thomas A.; and Linton, Nancy J. Peelably adhesive game board and method of use. 4,618,151, Cl. 273-148.00A.

Fahl, Richard L., to Dover Corporation. Quick connect-disconnect coupling. 4,618,171, Cl. 285-93.000.

Fahrbach, Erich: *See—*
Groitzsch, Dieter; and Fahrbach, Erich, 4,618,524, Cl. 428-198.000.

Fair, David L.; Justice, David D.; and Kelly, Pilar P., to Olin Corporation. Method of stabilizing metal-silica complexes in alkali metal halide brines. 4,618,403, Cl. 204-98.000.

Falater, Scott L., to Harris Corporation. Monolithic transient protector. 4,618,743, Cl. 179-16.0AA.

Falgout, Thomas E., Sr.; and Hester, John W., to Team Engineering and Manufacturing, Inc. Hole opener. 4,618,010, Cl. 175-329.000.

Fan, You-Ling; Brode, George L.; and Rosen, Meyer R., to Union Carbide Corp. Process for producing a polymer water-in-oil emulsion. 4,618,647, Cl. 524-801.000.

Fannin, Stephen W.: *See—*
Miller, Joseph M.; Fannin, Stephen W.; and Steiner, Paul R., 4,618,929, Cl. 364-415.000.

Fanning, William J., to AT&T Technologies, Inc. Component module for piggyback mounting on a circuit package having dual-in-line leads, and methods of fabricating same. 4,617,708, Cl. 29-25.420.

Fanuc Ltd.: *See—*
Ikeda, Yoshiaki, 4,618,859, Cl. 340-724.000.

Fardeau, Benoit, to GAZ de France. Apparatus and method for producing and storing heated liquid. 4,617,910, Cl. 126-362.000.

Farge, Daniel: *See—*
Corbet, Jean-Pierre; Cotrel, Claude; Farge, Daniel; and Paris, Jean-Marc, 4,618,599, Cl. 514-11.000.

Farmont Produktion GmbH & Co. KG: *See—*
Farmont, Rolf, 4,618,182, Cl. 296-223.000.

Farmont, Rolf, to ASC Auto Spezial Carosserie Vertrieb GmbH. Window opener. 4,618,176, Cl. 292-263.000.

Farmont, Rolf, to Farmont Produktion GmbH & Co. KG. Sun roof for a vehicle. 4,618,182, Cl. 296-223.000.

Farren, Carl A., to Beckman Industrial Corporation. Non-dispersive infrared analyzer having improved infrared source and detecting assemblies. 4,618,771, Cl. 250-343.000.

Favret, Uncas B., Jr.; and Duhon, Phil J., to Engineering Specialties, Inc. Process and apparatus for removing scum from a liquid surface. 4,618,430, Cl. 210-703.000.

Federer, David L. Method of forming a cast-in-place support column. 4,618,289, Cl. 405-236.000.

Fehlhaber, Hans-Wolfram: *See—*
Vertesy, Laszlo ; Bender, Rudolf; and Fehlhaber, Hans-Wolfram, 4,618,602, Cl. 514-54.000.

Fekete, Gyorgy: *See—*
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,618,611, Cl. 514-255.000.

Feldmuhle Aktiengesellschaft: *See—*
Pflaum, Hermann; and Vojacek, Herbert, 4,618,049, Cl. 192-107.00M.

Fell, Ferol S.; and Ratzlaff, Howard J., to Hesston Corporation. Forage harvester having supplemental crop disintegrating means. 4,617,786, Cl. 56-13.400.

Feller, Murray F., to Wilgood Corporation. Measurement of energy in flowing fluid. 4,618,266, Cl. 374-41.000.

Fels, Peter: *See—*
Steinke, Gerhard; Fels, Peter; Hoeg, Wolfgang; Lorenz, Werner; Ahnert, Wolfgang; Steffen, Frank; and Reichardt, Walter, 4,618,987, Cl. 381-82.000.

Ferguson, Charles L.: *See—*
Bartfield, William; and Ferguson, Charles L., 4,618,073, Cl. 221-11.000.

Fermentation Engineering, Inc.: *See—*
Armstrong, Gordon M., 4,617,861, Cl. 99-453.000.

Fernandez, Emilio: *See—*
Torti, Mario; and Fernandez, Emilio, 4,618,391, Cl. 156-353.000.

Fernandez, Ramon B.: *See—*
Lay, Khin M.; Palguta, Stephen E.; Fernandez, Ramon B.; and Cabalquinto, Santiago C., 4,617,716, Cl. 29-526.00R.

Ferranti plc: *See—*
Belch, Francis R., 4,618,858, Cl. 340-724.000.

Fialla, Peter, to Isovolta Oesterreichische Isolierstoffwerke AG. Phthalic acid low molecular weight polyesters and process for preparing the same. 4,618,699, Cl. 560-86.000.

Fiato, Rocco A.; and Soled, Stuart L., to Exxon Research and Engineering Company. High surface area dual promoted iron/-managanese spinel compositions. 4,618,597, Cl. 502-324.000.

Fiberglas Canada Inc.: *See—*
Harris, Leslie J., 4,618,104, Cl. 242-18.00G.

Fibronics Ltd.: *See—*
Bochor, Meir; and Gura, Mordechai, 4,618,952, Cl. 370-78.000.

Fiedler, Armin, to International Freezer Corporation. Freezer apparatus. 4,617,802, Cl. 62-125.000.

Fikentscher, Rolf: *See—*
Weiss, Wolfram; Balzer, Wolf-Dieter; Fikentscher, Rolf; Immel, Guenther; and Wolf, Hans, 4,618,371, Cl. 106-263.000.

Finger, Edward M. Silo hopper for silage unloaders. 4,618,304, Cl. 414-306.000.

Fingermatrix, Inc.: *See—*
Schiller, Michael, 4,618,988, Cl. 382-5.000.

Firestone Tire & Rubber Company, The: *See—*
Kay, Edward L.; and Roskos, Kenneth B., 4,618,667, Cl. 528-49.000.
Koch, Russell W.; and Snyder, Douglas D., 4,618,519, Cl. 428-63.000.
Tomaszewski, Walter, 4,617,771, Cl. 52-410.000.

Fischer, Hartmut: *See—*
Dereu, Norbert; Welter, Andre ; Wendel, Albrecht; Leyck, Sigurd; Parnham, Michael; Graf, Erich; Sies, Helmut; Betzing, Hans; and Fischer, Hartmut, 4,618,669, Cl. 530-331.000.

Fischer, Helmut. Electro-magnetic thickness measuring probe. 4,618,825, Cl. 324-230.000.

Fischer Imaging Corporation: *See—*
Siczek, Bernard W., 4,618,133, Cl. 269-323.000.

Fischer, Rolf: *See—*
Weitz, Hans-Martin; and Fischer, Rolf, 4,618,704, Cl. 560-262.000.

Fish, Aaron M.; D'Intino, Adamo M.; Moessner, Frank G.; and Mazoff, Stanley S., to Ilxo Unican Corp. Sliding glass door lock. 4,617,810, Cl. 70-14.000.

Fishburne, Francis B. Coupled pipes and sealed unions therefor. 4,618,170, Cl. 285-90.000.

Fisher, Marvin D.; and Bobsein, Louis E., to Westinghouse Electric Corp. Splicing methods for an extruded handrail. 4,618,387, Cl. 156-244.110.

Fisher, Robert S. Humidifier with controlled heat input. 4,618,462, Cl. 261-130.000.

Fisons Limited: *See*—
Eyley, Stephen C.; and Coltman, Stephen C. W., 4,618,715, Cl. 564-414.000.

Fitzgerald, Joseph M.: *See*—
Aipperspach, Anthony G.; Fitzgerald, Joseph M.; and Wu, Philip T., 4,618,943, Cl. 365-104.000.

Flack, Albert J.: *See*—
Hagerman, James E.; Mathewes, William D.; Rees, Fenton L.; and Flack, Albert J., 4,618,810, Cl. 318-803.000.

Flanders, Dale C.; and Lyszczarz, Theodore M., to Massachusetts Institute of Technology. Optical gap measuring. 4,618,261, Cl. 356-357.000.

Fleury, Paul A., V, to AT&T Bell Laboratories. Optical fiber tap with activatable chemical species. 4,618,211, Cl. 350-96.150.

Flisikowski, Peter, to U.S. Philips Corporation. Linear motor for the high-speed reciprocating movement of a rotor slide possessing mass. 4,618,789, Cl. 310-13.000.

Flohrs, Peter, to Robert Bosch GmbH. Darlington transistor circuit. 4,618,875, Cl. 357-46.000.

Florida State University: *See*—
Li, Paul Z., 4,618,271, Cl. 384-461.000.

Flowers, Thomas. Method of installing conduit. 4,618,124, Cl. 254-134.3FT.

Fluidtherm Corporation: *See*—
Brummel, Roger L., 4,617,742, Cl. 34-57.00A.

Fluor-Doris Incorporated: *See*—
Michel, Dominique; Johnson, Delbert B.; Pages, Jean F.; Foglia, Vincent F. P.; Martin, Jean G. M.; Vache , Michel P.; Sedillot, Francois G.; and Crull, Carroll M., 4,618,286, Cl. 405-208.000.

Fluorochem Inc.: *See*—
Baum, Kurt; Hunadi, Ronald O.; and Bedford, Clifford D., 4,618,734, Cl. 570-136.000.

FMC Corporation: *See*—
Hobson, Philip B.; and Keay, Robert E., 4,618,728, Cl. 568-652.000.

Fock, Jurgen: *See*—
Esselborn, Eberhard; and Fock, Jurgen, 4,618,457, Cl. 260-504.00R.

Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz; and Liedtke, Kurt, 4,617,780, Cl. 53-466.000.
Focke, Heinz; and Balmer, Oskar, 4,617,974, Cl. 141-239.000.
Focke, Heinz; and Liedtke, Kurt, to Focke & Co. (GmbH & Co.). Method and apparatus for wrapping cigarette packets in film blanks. 4,617,780, Cl. 53-466.000.
Focke, Heinz; and Balmer, Oskar, to Focke & Co., (GmbH & Co.). Apparatus for packaging tobacco portions. 4,617,974, Cl. 141-239.000.

Foggini, Giovanni. Preformed integral coating, particularly for motor-vehicle gear shift levers. 4,617,834, Cl. 74-523.000.

Fogle, Ronald L.: *See*—
Golicz, Roman M.; Seniff, Dana W.; Fogle, Ronald L.; and Huggins, Orville C., 4,617,784, Cl. 53-540.000.

Foglia, Vincent F. P.: *See*—
Michel, Dominique; Johnson, Delbert B.; Pages, Jean F.; Foglia, Vincent F. P.; Martin, Jean G. M.; Vache , Michel P.; Sedillot, Francois G.; and Crull, Carroll M., 4,618,286, Cl. 405-208.000.

Fonne, Gunnar J.; Daae-Johansen, Finn; Thoresen, Per; and Nilsen, Stein-Arne, to Vefi A/S. Double-walled panels with end closure. 4,617,777, Cl. 52-802.000.

Forbes, Patricia J.: *See*—
Covey, Rupert A.; Forbes, Patricia J.; and Bell, Allyn R., 4,618,365, Cl. 71-92.000.

Ford, Michael E.; and Johnson, Thomas A., to Air Products and Chemicals, Inc. Preparation of polyethylene polyamines from 2-aminoethyl sulfuric acid. 4,618,716, Cl. 564-469.000.

Ford Motor Company: *See*—
Bilharz, Manfred; Heider, Peter; Roper, Hartmut; Taal, Martin; Henken, Fritz; Kohl, Ernst; and Schubert, Dietmar, 4,618,123, Cl. 251-28.000.

Forouhi, Abdul R.; and Allen, Bert L., to Advanced Micro Devices, Inc. Method of forming a silicon nitride film transparent to ultraviolet radiation and resulting article. 4,618,541, Cl. 428-688.000.

Forquer, Richard, to Fulcrum Enterprises. Method for preparing an espresso-type coffee beverage. 4,618,500, Cl. 426-433.000.

Forster, Herbert: *See*—
Handtmann, Dieter; Mossburger, Egon; and Forster, Herbert, 4,618,913, Cl. 361-315.000.

Fory, Werner: *See*—
Gass, Karl; Fory, Werner; Meyer, Willy; and Topfl, Werner, 4,618,363, Cl. 71-90.000.

Foseco Trading A.G.: *See*—
Barnes, Andrew; Elliott, Gary K.; MacFarlane, William; and Pheasant, Stephen T., 4,618,079, Cl. 222-591.000.

Foster Wheeler Energy Corporation: *See*—
Gamble, Robert L., 4,617,877, Cl. 122-4.00D.

Foundation: The Research Institute for Special Inorganic Materials, The: *See*—
Okamura, Kiyohito; Hasegawa, Yoshio; Kuroo, Yoshiyasu; and Ugaji, Masana, 4,618,591, Cl. 501-90.000.

Fournier, Jean-Paul; and Choay, Patrick, to Choay S.A. Substituted 2,4-dialkoxy benzene sulfonyl chlorides. 4,618,459, Cl. 260-543.00R.

Fox, David A., to Westinghouse Electric Corp. Frequency control circuit. 4,618,920, Cl. 363-37.000.

Framatone: *See*—
Defaucheux, Jacques B.; and Guedj, Freddy, 4,618,471, Cl. 376-228.000.

Frantisek, Flekac. Flow press, especially flow sammying machine, for the production and processing of leather. 4,617,809, Cl. 69-44.000.

Franzolini, Marc; Maria, Edmond; Vanderschaeghe, Alain; and Bezier, Jean, to Stein Industrie. Assembly of ferritic stainless steel tubes on a carbon steel tube-plate. 4,617,990, Cl. 165-173.000.

Frass, Werner: *See*—
Mohr, Dieter; and Frass, Werner, 4,618,405, Cl. 204-129.750.

Freeman, Jerry H., to UNR, Inc. Light fixture. 4,618,205, Cl. 339-125.00L.

Freeston, Ian L.: *See*—
Brown, Brian H.; Barber, David C.; and Freeston, Ian L., 4,617,939, Cl. 128-734.000.

Freitag, Hans-Albrecht: *See*—
Volland, Robert; Freitag, Hans-Albrecht; Seesing, Johannes; and Bergmann, Herbert, 4,618,532, Cl. 428-304.400.

Fremont Special Machine Co., Inc.: *See*—
Simonton, Robert D.; Cattano, John D.; and Mason, Robert K., 4,618,546, Cl. 429-133.000.

French Systems, Inc.: *See*—
Hindman, David B.; Paduchowski, James S.; and Lima, Joseph D., 4,618,431, Cl. 210-741.000.

Fresenius AG: *See*—
Polaschegg, Hans-Dietrich, 4,618,343, Cl. 604-29.000.

Freudenthal, Merton L. Annular lip type sealing ring with pre-loaded lip portions. 4,618,154, Cl. 277-205.000.

Frey, Albert, to Heinrich Frey, Firma. Method of dispensing a deformable and flowable filling material. 4,617,701, Cl. 17-45.000.

Frey, Robert: *See*—
Pradere, Francois; and Frey, Robert, 4,618,783, Cl. 307-426.000.

Frey, Thomas: *See*—
Esper, Friedrich; and Frey, Thomas, 4,618,351, Cl. 55-146.000.

Freyberger, Laurin C.; Mlynek, Daniel; and Schmidtpott, Friedrich, to ITT Industries, Inc. Set of three integrated circuits for digital video signal processing in color-television receivers. 4,618,881, Cl. 358-27.000.

Fried, Herbert E.: *See*—
Wood, Donald L.; and Fried, Herbert E., 4,618,400, Cl. 162-5.000.

Fried, Lawrence, to United States of America, Navy. Thermoelectric actuator for mirror adjustment. 4,618,223, Cl. 350-611.000.

Friedrich, Wolfgang: *See*—
Brandenstein, Manfred; Haas, Roland; Herrmann, Gerhard; Friedrich, Wolfgang; and Edelmann, Ludwig, 4,618,335, Cl. 474-112.000.

Fritz, Werner: *See*—
Sturm, Walter; Becker, Helmut; Witt, Jurgen; Fritz, Werner; and Eysholdt, Ursula, 4,618,776, Cl. 250-372.000.

Fuji Electric Company Ltd.: *See*—
Sato, Noritada; Seki, Yasukazu; and Ishiwate, Osamu, 4,618,381, Cl. 148-189.000.
Tago, Keiichiro, 4,618,862, Cl. 340-870.370.

Fuji Electric Corporate Research and Development Ltd.: *See*—
Sato, Noritada; Seki, Yasukazu; and Ishiwate, Osamu, 4,618,381, Cl. 148-189.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, 4,617,840, Cl. 74-865.000.

Fuji Photo Film Co., Ltd.: *See*—
Dan, Shigeyuki; Ishii, Kazuo; Kato, Eiichi; and Sera, Hidefumi, 4,618,557, Cl. 430-114.000.
Ichijima, Seiji; Usui, Hideo; and Deguchi, Naoyasu, 4,618,571, Cl. 430-505.000.
Kawakami, Chikuni, 4,618,812, Cl. 323-224.000.
Kitada, Akira, 4,618,778, Cl. 250-483.100.
Maekawa, Yukio; and Mukunoki, Yasuo, 4,618,575, Cl. 430-634.000.
Mihayashi, Keiji; Kobayashi, Hidetoshi; and Takada, Shunji, 4,618,572, Cl. 430-543.000.
Oishi, Kengo; and Suzuki, Masaaki, 4,618,903, Cl. 360-132.000.
Okamura, Hisashi; Kobayashi, Hidetoshi; Nishikawa, Toshihiro; and Tamoto, Koji, 4,618,573, Cl. 430-558.000.
Ono, Mitsunori; Itoh, Isamu; and Mihayashi, Keiji, 4,618,563, Cl. 430-219.000.
Yuyama, Yasuaki; Nakano, Junji; Kondo, Shyunichi; Sato, Hideo; and Sawada, Kenichi, 4,618,553, Cl. 430-69.000.

Fuji Photo Optical Co., Ltd.: *See*—
Arakawa, Satoshi, 4,617,915, Cl. 128-4.000.

Fujibayashi, Kazuo: *See*—
Sugiura, Muneharu; Fujibayashi, Kazuo; and Tsuji, Sadahiko, 4,618,219, Cl. 350-427.000.

Fujii, Toru: *See*—
Ikari, Kazuo; and Fujii, Toru, 4,618,234, Cl. 354-225.000.

Fujikawa, Motoi; and Kagata, Tooru, to Aisin Seiki Kabushiki Kaisha. Wheel hub clutch assembly. 4,618,044, Cl. 192-54.000.

Fujimori, Hiroyoshi: *See*—
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,618,885, Cl. 358-98.000.

Fujimoto, Masakazu; and Inoue, Naoyuki, to Ebara Corporation. Apparatus for cleaning heat exchanger tubes. 4,617,987, Cl. 165-95.000.

Fujimura, Hisao: *See*—
Ohashi, Tamaki; Suzuki, Tsunefusa; Nakada, Kaoru; Hoshi, Nobuya; Fujimura, Hisao; and Ui, Hiromitu, 4,617,831, Cl. 74-10.330.

Fujisawa, Osamu: *See*—
Ozaki, Yukio; Fujisawa, Osamu; Sakai, Ryukichi; and Hasegawa, Hiroshi, 4,618,752, Cl. 200-148.00R.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Teraji, Tsutomu; Shiokawa, Youichi; Okumura, Kazuo; and Sato, Yoshinari, 4,618,610, Cl. 514-242.000.

Fujita, Masahiko: *See*—
Fukushima, Toshihiko; Miyamoto, Seigo; Fujita, Masahiko; Musoo, Masanori; and Sayo, Kosaku, 4,618,092, Cl. 236-92.00B.

Fujitani, Yoshiyasu; Muraki, Hideaki; Yokota, Koji; Sobukawa, Hideo; and Matsunaga, Shinichi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Exhaust gas purifying method and apparatus for internal combustion engines. 4,617,794, Cl. 60-274.000.

Fujitsu Limited: *See*—
Hattori, Toshihiro; Ishihara, Masaki; Uriuhara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,618,043, Cl. 192-0.052.
Mizukoshi, Masataka; and Endo, Teiichi, 4,618,879, Cl. 357-74.000.
Mukai, Ryoichi, 4,617,723, Cl. 29-576.00B.
Okajima, Yoshinori, 4,618,944, Cl. 365-189.000.
Yokoyama, Naoki; and Ohshima, Toshio, 4,617,724, Cl. 29-576.00B.

Fujiwara, Masatoshi; and Kuroda, Masato, to Yamatake-Honeywell Co. Limited. Switching valve and an electro-pneumatic pressure converter utilizing the same. 4,617,952, Cl. 137-85.000.

Fujizoki Pharmaceutical Co., Ltd.: *See*—
Sato, Takashi; and Kubo, Emiko, 4,618,588, Cl. 436-511.000.

Fukuoka, Yoshikazu: *See*—
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,618,606, Cl. 514-202.000.

Fukushi, Yukihiro; and Segawa, Hiroyuki, to Kabushiki Kaisha Toshiba. Image forming apparatus and attachment which together enter an energy saving mode. 4,618,245, Cl. 355-14.0SH.

Fukushima, Motoo: *See*—
Takahashi, Masaharu; and Fukushima, Motoo, 4,618,639, Cl. 524-262.000.

Fukushima, Toshihiko; Miyamoto, Seigo; Sayo, Kosaku; and Emi, Kenji, to Hitachi, Ltd. Refrigerant flow control device. 4,617,804, Cl. 62-212.000.

Fukushima, Toshihiko; Miyamoto, Seigo; Fujita, Masahiko; Musoo, Masanori; and Sayo, Kosaku, to Hitachi, Ltd. Refrigerant flow rate control device. 4,618,092, Cl. 236-92.00B.

Fukuyama, Ryoji: *See*—
Nawata, Makoto; Fukuyama, Ryoji; Nakazato, Norio; and Nishiumi, Masaharu, 4,618,398, Cl. 156-643.000.

Fukuyori, Kazusige, to Hitachi, Ltd. Structural metal sheet and method for forming the same. 4,617,818, Cl. 72-379.000.

Fulcrum Enterprises: *See*—
Forquer, Richard, 4,618,500, Cl. 426-433.000.

Funaki, Yuji: *See*—
Ishiguri, Yukio; Takano, Hirotaka; and Funaki, Yuji, 4,618,620, Cl. 514-383.000.

Futakuchi, Yorio: *See*—
Oshiro, Nobuaki; and Futakuchi, Yorio, 4,617,885, Cl. 123-192.00B.

Futatsumori, Koji: *See*—
Takago, Toshio; Arai, Masatoshi; and Futatsumori, Koji, 4,618,646, Cl. 524-783.000.

Futch, Laurence E., Jr.: *See*—
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; and Deal, James F., III, 4,618,348, Cl. 44-51.000.

Futterknecht, Fritz: *See*—
Hirt, Walter; and Futterknecht, Fritz, 4,618,356, Cl. 65-173.000.

Fyfe, Edward R.; Slater, William M.; and Watson, Ronald J. Aseismic bearing for bridge structures. 4,617,769, Cl. 52-167.000.

G. D. Societa per Azioni: *See*—
Mattei, Riccardo; and Natali, Roberto, 4,617,782, Cl. 53-479.000.
Mattei, Riccardo, 4,617,943, Cl. 131-109.300.

Gailus, Paul H.: *See*—
Gannon, Mark A.; Yester, Francis R., Jr.; and Gailus, Paul H., 4,618,836, Cl. 331-96.000.

Galambos, Ludwig: *See*—
Teglasy, Gyorgy; and Galambos, Ludwig, 4,618,074, Cl. 221-15.000.

Gamble, Robert L., to Foster Wheeler Energy Corporation. Fluidized bed steam generator and method of generating steam with flyash recycle. 4,617,877, Cl. 122-4.00D.

Gammans, Richard E.: *See*—
Mayol, Robert F.; and Gammans, Richard E., 4,618,680, Cl. 546-234.000.

Gannon, Mark A.; Yester, Francis R., Jr.; and Gailus, Paul H., to Motorola, Inc. Wide band dielectric resonator oscillator having temperature compensation. 4,618,836, Cl. 331-96.000.

Gans, Michael J., to AT&T Bell Laboratories. Scanning beam antenna with linear array feed. 4,618,867, Cl. 343-781.00P.

Gardette, Andre: *See*—
Cabany, Pierre; Gardette, Andre; Jacquet, Xavier; Tollis, Aurelio; and Tollis, Fernando, 4,618,757, Cl. 219-60.00R.

Garehime, Jacob W., Jr. Annularly symmetrical multiple fire weapon. 4,617,750, Cl. 42-65.000.

Garman, James A.; Swift, Stephen D.; Livesay, Richard E.; and Arians, Arlyn J., to Caterpillar Inc. Track joint retaining apparatus. 4,618,190, Cl. 305-39.000.

Garner, David L. Chaff spreading apparatus. 4,617,942, Cl. 130-27.00R.

Garrett Corporation, The: *See*—
Denk, Joseph, 4,617,726, Cl. 29-598.000.

Garwood, William E.: *See*—
Chester, Arthur W.; Garwood, William E.; and Tabak, Samuel A., 4,618,737, Cl. 585-329.000.

Gasparics, Istvan. Safety cigarette holder in a stackable ashtray. 4,617,944, Cl. 131-235.100.

Gass, Karl; Fory, Werner; Meyer, Willy; and Topfl, Werner, to Ciba-Geigy Corporation. N-phenylsulfonyl-N'-triazinylureas. 4,618,363, Cl. 71-90.000.

Gauthier-Lafaye, Jean; and Perron, Robert, to Rhone-Poulenc Industries. Process for the preparation of acetic anhydride. 4,618,460, Cl. 260-549.000.

Gayler, Robert J., to Piper FM Limited. Fuel delivery to internal combustion engines. 4,617,898, Cl. 123-460.000.

Gayne, Gregory C.: *See*—
Green, Paul G.; and Gayne, Gregory C., 4,617,684, Cl. 2-20.000.

GAZ de France: *See*—
Fardeau, Benoit, 4,617,910, Cl. 126-362.000.

Geary, Robert J.; and Geary, Robert J., III. Plant cryoprotection. 4,618,442, Cl. 252-70.000.

Geary, Robert J., III: *See*—
Geary, Robert J.; and Geary, Robert J., III, 4,618,442, Cl. 252-70.000.

Gebelius, Sven Runo V. Poleshaped supporting member, and base structure for attachment of same. 4,617,768, Cl. 52-40.000.

Gebhardt, Franz: *See*—
Emonts, Heinfried; and Gebhardt, Franz, 4,618,538, Cl. 428-428.000.

Gebhardt, Peter: *See*—
Heim, Ulrich; and Gebhardt, Peter, 4,617,924, Cl. 128-204.230.

Gebr. Bode & Co. GmbH: *See*—
Dilcher, Dietmar, 4,617,756, Cl. 49-212.000.

Gegel, Harold L.; Malas, James C.; Prasad, Yellapregada V. R. K.; Doraivelu, Sokka M.; Barker, Douglas R.; Morgan, James T., Jr.; and Lark, Kristine A., to United States of America, Air Force. Optimizing hot workability and controlling microstructures in difficult to process high strength and high temperature materials. 4,617,817, Cl. 72-364.000.

Geldermans, Pieter; and Mathad, Gangadhara S., to International Business Machines Corporation. Method of fabricating a chip interposer. 4,617,730, Cl. 29-843.000.

Gemmler, Armin, to Licentia Patent-Verwaltungs-GmbH. Chemical metallization process with radiation sensitive chromium (III) complex. 4,618,568, Cl. 430-417.000.

Genco, Louis V.; and Task, Harry L., to United States of America, Air Force. Accommodative amplitude and speed measuring instrument. 4,618,231, Cl. 351-237.000.

Genelco, Inc.: *See*—
Harding, Robert C.; and Olsen, Edward H., 4,618,855, Cl. 340-605.000.

Genencor, Inc.: *See*—
Dwiggins, Bruce L.; Pickens, Carl E.; and Niekamp, Carl W., 4,618,579, Cl. 435-96.000.

General Electric Company: *See*—
Baliga, Bantval J., 4,618,872, Cl. 357-23.400.
Hinds, John K., 4,618,924, Cl. 364-191.000.
Kim, Bang M., 4,618,428, Cl. 210-648.000.
Liu, Wan-Li, 4,618,644, Cl. 524-535.000.
Lohmeijer, Johannes H. G. M.; Noordermeer, Jacobus W. M.; and Bussink, Jan, 4,618,637, Cl. 524-192.000.
Modic, Frank J., 4,618,522, Cl. 428-145.000.
Redington, Rowland W.; and Axel, Leon, 4,618,827, Cl. 324-309.000.
Sieb, Lawrence E., Jr.; and Mliner, David G., 4,618,990, Cl. 382-43.000.
Theobald, Paul R., 4,618,739, Cl. 174-52.0FP.
Traver, Frank J.; and Simoneau, Edward T., 4,618,689, Cl. 556-425.000.

General Foods Corporation: *See*—
Parliment, Thomas H., 4,618,501, Cl. 426-534.000.

General Kinematics: *See*—
Musschoot, Albert, 4,617,832, Cl. 74-87.000.

General Motors Corporation: *See*—
Jandeska, William F., Jr., 4,618,473, Cl. 419-11.000.
MacIver, Bernard A.; Erskine, James C., Jr.; and Bierlein, John C., 4,618,505, Cl. 427-38.000.
Miller, Gary T.; Marker, Ronald E.; and Marker, Richard L., 4,617,856, Cl. 92-71.000.
Spoolstra, Gregg R., 4,618,095, Cl. 239-90.000.

General Research of Electronics, Inc.: *See*—
Imazeki, Kazuyoshi; Tanaka, Toshiyuki; and Miyakoshi, Hiromichi, 4,618,997, Cl. 455-76.000.

General Telephone of Illinois: *See*—
Smith, Robert W., 4,618,175, Cl. 292-205.000.

Gent, Colin W., to Imperial Chemical Industries PLC. Synthesis gas. 4,618,451, Cl. 252-373.000.

Geophysical Engineering Company: *See*—
Assaf, Gad, 4,617,800, Cl. 60-689.000.

Georg Fischer Aktiengesellschaft: *See*—
Thalmann, Alfred; and Lehmann, Ernesto, 4,618,168, Cl. 285-21.000.

Georg Prinzing GmbH & Co. KG Betonformen-und Maschinenfabrik: *See*—
Kraiss, Richard, 4,618,122, Cl. 249-94.000.

Georgia Kaolin Company, Inc.: *See*—
Thompson, Thomas D., III; Polestak, Walter J.; and Bradshaw, Robert W., 4,618,374, Cl. 106-288.00B.

Georgiou, George E.; and Poulsen, Martin E., to AT&T Bell Laboratories. X-ray source comprising double-angle conical target. 4,618,972, Cl. 378-34.000.

Gerbe, Helmut, to KEUCO Paul Keune GmbH & Co. KG. Wall mount for an accessory. 4,618,117, Cl. 248-222.100.

Gersten, Susan W.: *See*—
Kuck, Mark A.; and Gersten, Susan W., 4,618,345, Cl. 23-293.00R.

Gesser, Hyman D.; Hunter, Norman R.; and Morton, Lawrence. Direct conversion of natural gas to methanol by controlled oxidation. 4,618,732, Cl. 568-910.500.

Gettens, John W.; Sigrimis, Nick A.; and Scott, Norman R., to Cornell Research Foundation, Inc. Passive activity monitor for livestock. 4,618,861, Cl. 340-825.540.

Gibson, Christopher S. Portable exercise device. 4,618,144, Cl. 272-134.000.

Gilad, Amir: *See*—
Shimoni, Yair; Gilad, Amir; and Shapira, Alex, 4,617,938, Cl. 128-708.000.

Gilch, Heinz; von Voithenberg, Hubertus; and Albert, Karl-Heinz, to USM Corporation. Adhesive compositions. 4,618,651, Cl. 525-130.000.

Gill, Steven S. Surgical appliance and a method for introducing drainage tubing into cavities. 4,617,929, Cl. 128-305.300.

Gilli, Luigi; and Peiretti, Domenico, to Prima Industrie S.p.A. Focusing head for a laser-beam cutting machine. 4,618,758, Cl. 219-121.0LG.

Gilmour, James: *See*—
Cramp, Michael C.; Gilmour, James; and Parnell, Edgar W., 4,618,366, Cl. 71-94.000.

Giordano, Claudio: *See*—
Castaldi, Graziano; and Giordano, Claudio, 4,618,697, Cl. 560-56.000.

Girault, Pierre: *See*—
Tessier, Jean; and Girault, Pierre, 4,618,364, Cl. 71-92.000.

Gist-Brocades N.V.: *See*—
Heijnen, Joseph J.; Lourens, Pieter A.; and Vixseboxse, Albertus J., 4,618,418, Cl. 210-151.000.

Gjertsen, Robert K.; Wilson, John F.; and Weiland, Walter F., Jr., to Westinghouse Electric Corp. Nuclear reactor fuel assembly with fuel rod removal means. 4,618,472, Cl. 376-446.000.

Glantschnig, Werner J., to AT&T Technologies, Inc. Method and apparatus for analyzing a porous nonhomogeneous cylindrical object. 4,618,975, Cl. 378-51.000.

Glass, James P., Jr.: *See*—
Heinzelmann, Fred J.; Rothblatt, Noah S.; Glass, James P., Jr.; Say, Geoffrey R.; Chludzinski, George R.; Sartori, Guido; and Ho, W. S. Winston, 4,618,481, Cl. 423-228.000.

Glassy, Mark C.: *See*—
Handley, Harold H.; Glassy, Mark C.; Hagiwara, Yoshihide; and Hagiwara, Hideaki, 4,618,577, Cl. 435-7.000.

Gleason, Anthony M.: *See*—
Mintz, Donald J.; and Gleason, Anthony M., 4,618,432, Cl. 210-748.000.

Gloger, Kelly C.: *See*—
Nelson, Maynard A.; and Gloger, Kelly C., 4,617,689, Cl. 5-400.000.

Gloria, Karl F. L.; Costinescu-Tataranu, Alexandru B.; Schuster, Wilhelm; and Wittekind, Jurgen, to Ruhrgas Aktiengesellschaft. Composition and a method for covering the sump in cavities. 4,618,282, Cl. 405-53.000.

GN Alternatives: *See*—
Nelson, Maynard A.; and Gloger, Kelly C., 4,617,689, Cl. 5-400.000.

Go, Seitaro, to Yugen Kaisha GO Chuzo Tekkosho. Connecting mechanism for pole members. 4,618,169, Cl. 285-86.000.

Gober, Karl-Heinz: *See*—
Stapel, Gunter; Gober, Karl-Heinz; Leyck, Sigurd; Wetzig, Helmut; Birkner, Christian; Kesselring, Kurt; Christ, Bruno; Steiner, Klaus; and Schroder, Friedhelm, 4,618,605, Cl. 514-177.000.

Godsen, Ronald: *See*—
Miller, Dye O.; Antunes, August J.; Antunes, Jerome; and Godsen, Ronald, 4,617,908, Cl. 126-20.000.

Goebel, Eickhart. Quick-clamping nut for use with a threaded member. 4,618,300, Cl. 411-433.000.

Goeschel, Wilhelm: *See*—
Czichy, Reinhard; and Goeschel, Wilhelm, 4,618,259, Cl. 356-152.000.

Golicz, Roman M.; Seniff, Dana W.; Fogle, Ronald L.; and Huggins, Orville C., to Monarch Marking Systems, Inc. Apparatus for stacking and banding tags. 4,617,784, Cl. 53-540.000.

Goodings, Rupert L.: *See*—
Ross, Peter F.; Rodgers, Ian W.; and Goodings, Rupert L., 4,618,846, Cl. 340-347.0DD.

Goodrich, Judson E., to Chevron Research Company. Method for producing industrial asphalts without air-blowing using hydrobromic acid. 4,618,372, Cl. 106-273.00R.

Goodyear Tire & Rubber Company, The: *See*—
Halasa, Adel F.; and Jalics, George, 4,618,650, Cl. 525-105.000.

Gordon, Arnold Z.; Morris, Jerry L.; and Mason, Gary E., to Gould, Inc. Method of forming a reactive metal anode having an edge seal. 4,618,503, Cl. 427-11.000.

Gorman, Kenneth G., Jr., to Rank Electronic Tubes, Inc. Precision electrode alignment. 4,618,800, Cl. 313-417.000.

Gorog, Sandor: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,618,611, Cl. 514-255.000.

Goto, Keisuke: *See*—
Tsukune, Hideo; and Goto, Keisuke, 4,618,989, Cl. 382-25.000.

Goto, Shoji: *See*—
Ohe, Junya; Wakita, Saburo; Yamatsuta, Kiichi; Goto, Shoji; Kutsukake, Yukinori; and Sugizaki, Masuo, 4,618,474, Cl. 420-436.000.

Gottschlich, Rudolf: *See*—
Hausberg, Hans-Heinrich; Bottcher, Henning; Gottschlich, Rudolf; Seyfried, Christoph; and Minck, Klaus-Otto, 4,618,614, Cl. 514-321.000.

Gotz, Dieter; and Zott, Werner, to Stahlecker, Fritz; and Stahlecker, Hans. Step bearing for a spinning rotor shaft. 4,618,273, Cl. 384-606.000.

Gould, Inc.: *See*—
Gordon, Arnold Z.; Morris, Jerry L.; and Mason, Gary E., 4,618,503, Cl. 427-11.000.

Graf, Erich: *See*—
Dereu, Norbert; Welter, Andre ; Wendel, Albrecht; Leyck, Sigurd; Parnham, Michael; Graf, Erich; Sies, Helmut; Betzing, Hans; and Fischer, Hartmut, 4,618,669, Cl. 530-331.000.

Grandis, Stanley, to S. G. D' or Industries, Inc. Ornamental belt. 4,617,685, Cl. 2-338.000.

Grassme, Ulrich; and Noske, Erich, to Siemens Aktiengesellschaft. Dental X-ray diagnostic unit. 4,618,974, Cl. 378-40.000.

Graves Spray Supply, Inc.: *See*—
Hedger, James E., Jr.; and Charette, Joseph G., 4,618,098, Cl. 239-290.000.

Graves, Victoria, to Exxon Research & Engineering Co. Polymerization catalyst. 4,618,660, Cl. 526-114.000.

Grebe, Alfred H., to Whittaker Corporation. Inflatable bed patient mattress. 4,617,690, Cl. 5-453.000.

Green, Harold A.; and Weinstein, Morris, to Millmaster Onyx Group, Inc. Foam generating compositions. 4,618,370, Cl. 106-111.000.

Green, Paul G.; and Gayne, Gregory C. Protective palm-pad. 4,617,684, Cl. 2-20.000.

Greenberger, Joseph I., to Wean United, Inc. Apparatus for descaling hot strip in a rolling mill. 4,617,815, Cl. 72-39.000.

Greenwood, William S.; and Weinmann, Karl, to Thomas & Betts Corporation. Isolated ground device for flat undercarpet cable. 4,618,203, Cl. 339-99.00R.

Gregg, Hans; and Artmeier, Theodor, to Carl Hurth Maschinen und Zahnradfabrik GmbH & Co. Mechanical handling mechanism, in particular for the loading and unloading of machine tools. 4,618,309, Cl. 414-753.000.

Gregg, James S.; and Mobley, Lawrence R., to Samsonite Corporation. Locking trolley for garment bag. 4,618,058, Cl. 206-291.000.

Greiner, Harry; and Schwebel, Adolf, to MABEG Maschinenbau GmbH & Company. Sheet feeder particularly for printing presses. 4,618,135, Cl. 271-9.000.

Gretag Aktiengesellschaft: *See*—
Horvath, Stephan; and Bernasconi, Carlo, 4,618,982, Cl. 381-36.000.

Greve, Peter: *See*—
Muller, Gerhard; Hohberg, Gerhard; and Greve, Peter, 4,618,759, Cl. 219-121.0LR.

Griggs, Calvin, to Richards Medical Company. Compression screw assembly. 4,617,922, Cl. 128-92.0YS.

Grimm, Robert A.; Kyung, Jai H.; Brusky, Phyllis L.; Holehouse, Joseph G.; and Chang, Biau-hung, to Ashland Oil, Inc. Preparation of menthane diisocyanate by addition of isocyanic acid to terpinyl monoisocyanates. 4,618,707, Cl. 560-337.000.

Grinnel Corporation: *See*—
Mears, James W., 4,618,002, Cl. 169-37.000.

Groitzsch, Dieter; and Fahrbach, Erich, to Carl Freudenberg, Firma. Microporous multilayer nonwoven material for medical applications. 4,618,524, Cl. 428-198.000.

Gronke, Helmut, to Diesel GmbH & Company. Flowmeter system. 4,617,827, Cl. 73-200.000.

Gross, David. Membrane switch with pivotable rocker. 4,618,754, Cl. 200-159.00B.

Gross, Ulrich: *See*—
van der Mast, Karel D.; and Gross, Ulrich, 4,618,766, Cl. 250-311.000.

Grouse, Alan, to Rotron, Inc. Ironless, brushless DC motor with wave-winding. 4,618,806, Cl. 318-254.000.

Grumman Aerospace Corporation: *See*—
Berde, Dennis; and Youskites, Edward, 4,618,889, Cl. 358-144.000.
Schmitz, Charles E., 4,618,763, Cl. 250-211.00R.

Gruner, Ronald H.: *See*—
Bratt, Richard G.; Gruner, Ronald H.; Jones, Thomas M.; and Nealon, James T., 4,618,925, Cl. 364-200.000.

Gsell, Laurenz: *See*—
Ackermann, Peter; Gsell, Laurenz; and Kohler, Boris, 4,618,615, Cl. 514-338.000.

GTE Communication Systems Corp.: *See*—
Reimer, William A., 4,618,113, Cl. 248-56.000.

GTE Products Corporation: *See*—
Schrank, Martin P., 4,618,802, Cl. 313-512.000.

GTE Valeron Corporation: *See*—
Allaire, Paul B.; and Stashko, Daniel R., 4,618,296, Cl. 407-42.000.
Horsch, Wilfried, 4,617,846, Cl. 82-1.200.

Gubler, Erich; and Siegrist, Max, to Ciba-Geigy Corporation. Process for the preparation of a hydroxyphenylcarboxylate. 4,618,700, Cl. 560-67.000.

Guedj, Freddy: *See*—
Defaucheux, Jacques B.; and Guedj, Freddy, 4,618,471, Cl. 376-228.000.
Gueret, Jean-Louis H., to L'Oreal. Make-up unit, for eyelashes in particular. 4,617,948, Cl. 132-88.500.
Guillet, James E.; and Redpath, Anthony E., to Ecoplastics Limited. Fluorene containing compounds and negative photoresist compositions therefrom. 4,618,566, Cl. 430-271.000.
Gundlach, Theodore F., to T. J. Gundlach Machine Company. Segmental shell for a coal crusher roll including specialized removal means. 4,617,709, Cl. 29-124.000.
Gura, Mordechai: *See*—
Bochor, Meir; and Gura, Mordechai, 4,618,952, Cl. 370-78.000.
Gurevich, Alex: *See*—
Gurevich, Joseph; Gurevich, Alex; and Gurevich, Jan, 4,618,279, Cl. 401-36.000.
Gurevich, Jan: *See*—
Gurevich, Joseph; Gurevich, Alex; and Gurevich, Jan, 4,618,279, Cl. 401-36.000.
Gurevich, Joseph; Gurevich, Alex; and Gurevich, Jan. Dishwashing apparatus with plural sponges. 4,618,279, Cl. 401-36.000.
Guth, Durward O. Sanitary wash bottle kit two part closure. 4,618,065, Cl. 215-3.000.
Haaheim, Gary R. Exercise machine. 4,618,139, Cl. 272-70.000.
Haas, Roland: *See*—
Brandenstein, Manfred; Haas, Roland; Herrmann, Gerhard; Friedrich, Wolfgang; and Edelmann, Ludwig, 4,618,335, Cl. 474-112.000.
Haas, Werner J.; and Haerten, Rainer L., to Siemens Gammasonics, Inc. Nuclear imaging apparatus. 4,618,772, Cl. 250-363.00S.
Hachiro, Nobuaki, to Nisshin Kogyo Kabushiki Kaisha. Pneumatic booster. 4,617,858, Cl. 92-98.00D.
Haendle, Joerg, to Siemens Aktiengesellschaft. X-ray diagnostic installation. 4,618,976, Cl. 378-99.000.
Haerten, Rainer L.: *See*—
Haas, Werner J.; and Haerten, Rainer L., 4,618,772, Cl. 250-363.00S.
Hagan, Richard J.; and Lempert, Dennis A. Seltzer filling apparatus and process. 4,617,973, Cl. 141-2.000.
Hagen, Floyd W., to Rosemount Inc. Test system for air data sensor. 4,617,826, Cl. 73-182.000.
Hager, John P.: *See*—
Hazen, Wayne W.; Thompson, David L.; Reynolds, James E.; Lombardo, Nicholas J.; Queneau, Paul B.; and Hager, John P., 4,618,480, Cl. 423-127.000.
Hagerman, James E.; Mathewes, William D.; Rees, Fenton L.; and Flack, Albert J., to Emerson Electric Company. Variable speed AC motor control system. 4,618,810, Cl. 318-803.000.
Hagiwara, Hideaki: *See*—
Handley, Harold H.; Glassy, Mark C.; Hagiwara, Yoshihide; and Hagiwara, Hideaki, 4,618,577, Cl. 435-7.000.
Hagiwara, Yoshihide: *See*—
Handley, Harold H.; Glassy, Mark C.; Hagiwara, Yoshihide; and Hagiwara, Hideaki, 4,618,577, Cl. 435-7.000.
Hailey, Charles D. Fluid injection apparatus and method used between a blowout preventer and a choke manifold. 4,618,314, Cl. 417-53.000.
Hajdu, Istvan: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,618,611, Cl. 514-255.000.
Hakaridani, Mitsuhiro: *See*—
Nishioka, Yoshiki; Hakaridani, Mitsuhiro; and Iwahashi, Hiroyuki, 4,618,983, Cl. 381-43.000.
Halasa, Adel F.; and Jalics, George, to Goodyear Tire & Rubber Company, The. Siloxane containing network polymer. 4,618,650, Cl. 525-105.000.
Halcon SD Group, Inc., The: *See*—
Rizkalla, Nabil, 4,618,705, Cl. 560-263.000.
Haley & Weller Limited: *See*—
Simpson, Geoffrey M., 4,617,866, Cl. 102-262.000.
Hall, Kenneth F.; and Chambers, George, to Martock Design Limited. High precision adjuster. 4,617,833, Cl. 74-110.000.
Halliburton Company: *See*—
Beck, Harold K., 4,617,999, Cl. 166-372.000.
Burris, Wesley J., II, 4,618,000, Cl. 166-373.000.
Davis, James L., 4,618,939, Cl. 364-555.000.
Ruhovets, Naum, 4,617,825, Cl. 73-152.000.
Sonne, Darrell S., 4,618,765, Cl. 250-269.000.
White, Billy W., 4,618,197, Cl. 339-17.00R.
Halocarbon Products Corporation: *See*—
Elliott, Arthur J.; and Astrologes, Gary W., 4,618,718, Cl. 564-481.000.
Hamada, Masataka: *See*—
Ishida, Tokuji; and Hamada, Masataka, 4,618,235, Cl. 354-403.000.
Hamalainen, Risto J.: *See*—
Koistinen, Pauli A. T.; and Hamalainen, Risto J., 4,617,715, Cl. 29-456.000.
Hamamoto, Takashi: *See*—
Munakata, Hirohide; Tomida, Yoshinori; Haruta, Masahiro; Hirai, Yutaka; Nishimura, Yukuo; and Hamamoto, Takashi, 4,618,561, Cl. 430-156.000.
Hambrecht, Juergen: *See*—
Muench, Volker; Hambrecht, Juergen; Naarmann, Herbert; Echte, Adolf; and Illers, Karl H., 4,618,636, Cl. 524-176.000.
Muench, Volker; Hambrecht, Juergen; Himmele, Walter; Echte, Adolf; and Swoboda, Johann, 4,618,668, Cl. 528-215.000.
Taubitz, Christof; Muench, Volker; Hambrecht, Juergen; Echte, Adolf; and Illers, Karl H., 4,618,633, Cl. 524-80.000.
Hamman, Martin E.; and Baughman, Gary M., to Rieke Corporation. Vented nestable pouring spout. 4,618,078, Cl. 222-478.000.
Hammond, Richard D. Level calibrating device. 4,617,820, Cl. 73-1.00E.
Hamner, Glen P.: *See*—
Hudson, Carl W.; and Hamner, Glen P., 4,618,412, Cl. 208-59.000.
Hampton, Ernestine. Combined storage container, sifter and dispenser for flour. 4,618,075, Cl. 222-189.000.
Hanada, Sadashi; and Nakabayashi, Akira, to Kawasaki Jukogyo Kabushiki Kaisha. Apparatus and method for assembling a structure comprising frames and shell plates. 4,618,089, Cl. 228-212.000.
Handley, Harold H.; Glassy, Mark C.; Hagiwara, Yoshihide; and Hagiwara, Hideaki, to University of California, The Regents of The. Human-human hybridoma, CLNH5. 4,618,577, Cl. 435-7.000.
Handtmann, Dieter; Mossburger, Egon; and Forster, Herbert, to Robert Bosch GmbH. Electrical capacitor including a quencher gas additive. 4,618,913, Cl. 361-315.000.
Hannah, Mark. Kicking shoe. 4,617,746, Cl. 36-133.000.
Hanrahan, Robert C.: *See*—
Hascal, Marcel; Mihai, Adrian; and Hanrahan, Robert C., 4,618,774, Cl. 250-364.000.
Hans Grohe GmbH & Co. KG: *See*—
Buzzi, Guenter, 4,618,091, Cl. 236-12.120.
Lorch, Werner, 4,617,965, Cl. 137-625.170.
Hansen, Craig N., to Hansen Engine Corporation. Vane and seal assembly. 4,618,318, Cl. 418-111.000.
Hansen Engine Corporation: *See*—
Hansen, Craig N., 4,618,318, Cl. 418-111.000.
Hansen, Holger: *See*—
Just, Herbert; and Hansen, Holger, 4,618,110, Cl. 244-151.00B.
Hansen, Per K., to Position Orientation Systems, Ltd. Displacement sensing device utilizing adjustable tuned circuit. 4,618,822, Cl. 324-207.000.
Hansen, Roger M. Precast roof bearing block. 4,618,290, Cl. 405-259.000.
Hara, Hiroari: *See*—
Tsuchida, Seiichi; Kodama, Yoshihiro; and Hara, Hiroari, 4,618,640, Cl. 524-272.000.
Harada, Naoki: *See*—
Kayane, Yutaka; Miyamoto, Tetsuya; Omura, Takashi; Sawamoto, Hirokazu; Harada, Naoki; and Takeshita, Akira, 4,618,671, Cl. 534-635.000.
Haraguchi, Hiroshi: *See*—
Sakakibara, Koji; Haraguchi, Hiroshi; and Yukumoto, Hideki, 4,617,895, Cl. 123-425.000.
Harbauer, Werner: *See*—
Wiessner, Edgar; Harbauer, Werner; and Paul, Klaus-Dieter, 4,618,807, Cl. 318-280.000.
Hardesty, Bryan L.: *See*—
Pope, Kent M.; and Hardesty, Bryan L., 4,618,744, Cl. 200-5.00A.
Harding, Robert C.; and Olsen, Edward H., to Genelco, Inc. Soil pollution monitoring system. 4,618,855, Cl. 340-605.000.
Harding, Ronald H.; and Totten, George E., to Union Carbide Corporation. Method of indirect liquid-phase heat transfer. 4,617,984, Cl. 165-1.000.
Hardy, Herbert L., to Polaroid Corporation. Current limited strobe charge circuit. 4,618,803, Cl. 315-241.00R.
Hargrave, Karl D.; Devlin, John P.; and Barsumian, Edward A., to Boehringer Ingelheim Limited. Substituted phenylalkyl-(piperazinyl or homopiperazinyl)alkyl-thiols and -thiocarbamates useful for the treatment of immunological, inflammatory, and allergic disorders. 4,618,677, Cl. 544-400.000.
Harmer, Alan L., to Battelle Development Corporation. Fiber-optical pressure detector. 4,618,764, Cl. 250-227.000.
Harper, Robert J., Jr., to United States of America, Agriculture. Process to impart smooth-dry and flame retardant properties to synthetic-cellulosic blended fabrics. 4,618,512, Cl. 427-381.000.
Harris, Betty W., to United States of America, Energy. Spot test for 1,3,5-triamino-2,4,6-trinitrobenzene, TATB. 4,618,452, Cl. 252-408.100.
Harris Corporation: *See*—
Falater, Scott L., 4,618,743, Cl. 179-16.0AA.
Harris, Leslie J., to Fiberglas Canada Inc. Strand transfer. 4,618,104, Cl. 242-18.00G.
Hart Group, The: *See*—
Hower, Larry H., 4,618,986, Cl. 381-67.000.
Hartan, Hans-Georg; Padberg, Werner; and Muller, Dietrich, to Chemische Fabrik Stockhausen GmbH; and Saarbergwerke AG. Process for separating mineral ultra-fine grain from washings obtained in coal processing or from coal slurries. 4,618,414, Cl. 209-5.000.
Hartel, Volker; and Theisen, Dieter, to Metzeler Kautschuk GmbH. Two-chamber engine bearing which has hydraulic damping. 4,618,128, Cl. 267-140.100.
Hartl, Walter: *See*—
Brettschneider, Horst; Hartl, Walter; and Peter, Diethard, 4,618,977, Cl. 378-139.000.
Hartranft, Marc D.; and Hendrickson, Thomas E., to Honeywell Inc. Isolated control signal source. 4,618,922, Cl. 363-127.000.
Haruta, Masahiro: *See*—
Munakata, Hirohide; Tomida, Yoshinori; Haruta, Masahiro; Hirai, Yutaka; Nishimura, Yukuo; and Hamamoto, Takashi, 4,618,561, Cl. 430-156.000.
Harvey, Samuel E., to Andrews Maclaren Limited. Foldable chair frame. 4,618,184, Cl. 297-19.000.

Harwood, Leopold A.; Chin, Danny; and Law, Kirk A., to RCA Corporation. Digital correlation indicator and hanging dot reduction system employing same. 4,618,882, Cl. 358-31.000.
Hascal, Marcel; Mihai, Adrian; and Hanrahan, Robert C. Instrument for measuring levels of concentration of tritium and tritium oxides in air. 4,618,774, Cl. 250-364.000.
Hasegawa, Hiroshi: *See*—
Ozaki, Yukio; Fujisawa, Osamu; Sakai, Ryukichi; and Hasegawa, Hiroshi, 4,618,752, Cl. 200-148.00R.
Hasegawa, Shumpei: *See*—
Kishida, Eiji; and Hasegawa, Shumpei, 4,617,891, Cl. 123-344.000.
Hasegawa, Yoshio: *See*—
Okamura, Kiyohito; Hasegawa, Yoshio; Kuroo, Yoshiyasu; and Ugaji, Masana, 4,618,591, Cl. 501-90.000.
Hashimoto, Isamu: *See*—
Nishida, Yoshikazu; and Hashimoto, Isamu, 4,617,843, Cl. 81-57.110.
Hashimoto, Masahiro; and Tani, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha; and Osaka Kongo Seito Co., Ltd. Grinding wheel manufacturing method. 4,618,349, Cl. 51-298.000.
Hashimoto, Mitsuru, to Ricoh Company, Ltd. Bisazo compounds useful as charge generating pigments in electrophotography. 4,618,672, Cl. 534-658.000.
Hashizume, Kazuko; Kase, Hiroshi; Kitamura, Shigeto; Iida, Takao; Shirahata, Kunikatsu; Omori, Kenji; and Shuto, Katsuichi, to Kyowa Hakko Kogyo Company, Ltd. Preventive and healing composition for diseases due to lipoxygenase metabolic products. 4,618,613, Cl. 514-312.000.
Hasler, Franz; Monch, Ernst; Reiter, Karl; and Timm, Heinrich. Automotive chassis. 4,618,163, Cl. 280-785.000.
Hasler, Rudolf, to U.S. Philips Corporation. Bridge circuit demodulator. 4,618,829, Cl. 329-103.000.
Haslop, William P.; Allonby, John M.; Akred, Brian J.; and Messenger, Edward T., to Albright & Wilson Limited. Spherulitic liquid detergent composition. 4,618,446, Cl. 252-135.000.
Hassell, George, to Jamestown Metal Marine Sales Inc. Wall panel joiner. 4,617,772, Cl. 52-461.000.
Hasson, Harrith M. Laparoscope cannula with improved suture receiving means. 4,617,933, Cl. 128-348.100.
Hatakeyama, Iwao; Maeda, Yasushi; Ishii, Osamu; and Yoshii, Shizuka, to Nippon Telegraph & Telephone Public Corporation. High density magnetic head. 4,618,901, Cl. 360-114.000.
Hatta, Koichi, to Sharp Kabushiki Kaisha. Electronic game apparatus. 4,618,927, Cl. 364-410.000.
Hattori, Jun; and Tsuji, Sadahiko, to Canon Kabushiki Kaisha. In-focus position detecting apparatus. 4,618,762, Cl. 250-201.000.
Hattori, Toshihiro; Ishihara, Masaki; Uriuhara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, to Isuzu Motors Limited; and Fujitsu Limited. Method for automatic control of a motor vehicle clutch. 4,618,043, Cl. 192-0.052.
Hattori, Toshihiro: *See*—
Honma, Minoru; Hattori, Toshihiro; Saito, Hideo; and Ishihara, Masaki, 4,618,040, Cl. 192-0.090.
Hauni-Werke Korber & Co. KG.: *See*—
Heitmann, Bob, 4,618,293, Cl. 406-28.000.
Hausberg, Hans-Heinrich; Bottcher, Henning; Gottschlich, Rudolf; Seyfried, Christoph; and Minck, Klaus-Otto, to Merck Patent Gesellschaft mit beschrankter Haftung. Method of treating psychosis using tetrahydrocarbazole derivatives. 4,618,614, Cl. 514-321.000.
Hawkins, James B.: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; and Beeland, William D., 4,617,862, Cl. 100-53.000.
Hayashi, Hideyuki, to Toyota Jidosha Kabushiki Kaisha. Power transfer device for four-wheel drive vehicle. 4,618,022, Cl. 180-249.000.
Hayashi, Shozo: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,618,914, Cl. 361-315.000.
Hayes, Charles F.: *See*—
Couey, H. Melvin; and Hayes, Charles F., 4,618,497, Cl. 426-233.000.
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; and Deal, James F., III, to Petroleum Fermentations N.V. Combustion of viscous hydrocarbons. 4,618,348, Cl. 44-51.000.
Hayes, Norman J. Animal identification and control system. 4,617,876, Cl. 119-155.000.
Hays, Dan A.; and Wayman, William H., to Xerox Corporation. Apparatus, process for charging toner particles. 4,618,241, Cl. 355-3.0DD.
Hazen, Wayne W.; Thompson, David L.; Reynolds, James E.; Lombardo, Nicholas J.; Queneau, Paul B.; and Hager, John P., to Resource Technology Associates. Recovery of alumina values from alunite ore. 4,618,480, Cl. 423-127.000.
Head, Robert A.; and Whyman, Robin, to Imperial Chemical Industries PLC. Catalytic process. 4,618,628, Cl. 518-700.000.
Heberle, Hans-Jorg; and Rudert, Wolfgang, to MTU Motoren und Turbinen-Union Friedrichshafen GmbH. Diesel engine with injection pump coordinated to each cylinder. 4,617,903, Cl. 123-501.000.
Hecker, Leonard R., to McNeilab, Inc. 2-amino-4,5-dihydro-1H-imidazole-1-carboxanilides. 4,618,682, Cl. 548-315.000.
Hedger, James E., Jr.; and Charette, Joseph G., to Graves Spray Supply, Inc. Fiberglass spray nozzle. 4,618,098, Cl. 239-290.000.
Hefner, Robert E., Jr.; and Messick, Virginia B., to Dow Chemical Company, The. Polymer modified epoxy resin compositions. 4,618,658, Cl. 525-454.000.
Heidelberger, James E.: *See*—
Bayne, Robert T.; and Heidelberger, James E., 4,618,257, Cl. 356-71.000.
Heider, Peter: *See*—
Bilharz, Manfred; Heider, Peter; Roper, Hartmut; Taal, Martin; Henken, Fritz; Kohl, Ernst; and Schubert, Dietmar, 4,618,123, Cl. 251-28.000.
Heijnen, Joseph J.; Lourens, Pieter A.; and Vixseboxse, Albertus J., to Gist-Brocades N.V. Fluidized bed reactor. 4,618,418, Cl. 210-151.000.
Heilmeier & Weinlein Fabrik fur Oel-Hydraulik GmbH & Co., KG: *See*—
Brunner, Rudolf, 4,617,962, Cl. 137-613.000.
Heim, Ulrich; and Gebhardt, Peter, to Dragerwerk AG. Method and apparatus for artificial respiration and the measurement of breathing gas values. 4,617,924, Cl. 128-204.230.
Heimbuch, Alvin H.: *See*—
Parker, John A.; Heimbuch, Alvin H.; Hsu, Ming-ta S.; and Chen, Timothy S., 4,618,652, Cl. 525-282.000.
Heinemann Electric Company: *See*—
Thompson, Harry A., III, 4,618,745, Cl. 200-50.00C.
Heinrich Frey, Firma: *See*—
Frey, Albert, 4,617,701, Cl. 17-45.000.
Heinzelmann, Fred J.; Rothblatt, Noah S.; Glass, James P., Jr.; Say, Geoffrey R.; Chludzinski, George R.; Sartori, Guido; and Ho, W. S. Winston, to Exxon Research and Engineering Co. Absorbent composition containing a severely hindered amino compound and an amine salt and process for the absorption of H_2S using the same. 4,618,481, Cl. 423-228.000.
Heitmann, Bob, to Hauni-Werke Korber & Co. KG. Method and apparatus for pneumatically transporting rod-shaped articles of the tobacco processing industry. 4,618,293, Cl. 406-28.000.
Hellstroem, Jerker, to Aktiebolaget IRO; and Aros Electronics AB. Loom control system. 4,617,971, Cl. 139-370.200.
Hendrickson, Thomas E.: *See*—
Hartranft, Marc D.; and Hendrickson, Thomas E., 4,618,922, Cl. 363-127.000.
Hendrixon, John, to Sealed Power Corporation. Electrohydraulic control of a spool valve for energizing a heavy duty automatic transmission clutch. 4,617,968, Cl. 137-625.640.
Hengel, Rolf, to Hoechst Aktiengesellschaft. Concentrated, aqueous dispersions of vinylidene fluoride polymers and a process for their preparation. 4,618,641, Cl. 524-284.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Engelskirchen, Konrad; Stein, Werner; Bahn, Michael; Schiefer-stein, Ludwig; Schindler, Joachim; and Schmid, Rolf, 4,618,582, Cl. 435-104.000.
Henken, Fritz: *See*—
Bilharz, Manfred; Heider, Peter; Roper, Hartmut; Taal, Martin; Henken, Fritz; Kohl, Ernst; and Schubert, Dietmar, 4,618,123, Cl. 251-28.000.
Hensley, Albert L., Jr.: *See*—
Tait, A. Martin; Nevitt, Thomas D.; and Hensley, Albert L., Jr., 4,618,594, Cl. 502-66.000.
Herman Miller, Inc.: *See*—
Kelley, James O., 4,618,192, Cl. 312-245.000.
Herrigel, Howard R., to Resources Conservation Co. Method of maintaining adequate seed crystal in preferential precipitation systems. 4,618,429, Cl. 210-652.000.
Herrington, Daniel R.; and Kuch, Philip L., to Standard Oil Company, The. Reduction of carbon oxides with hydrogen sulfide. 4,618,723, Cl. 568-70.000.
Herrington, Fox J., to Mobil Oil Corporation. Method and apparatus for the manufacture of plastic bags having interlocking profile extrusions. 4,618,383, Cl. 156-66.000.
Herrmann, Gerhard: *See*—
Brandenstein, Manfred; Haas, Roland; Herrmann, Gerhard; Friedrich, Wolfgang; and Edelmann, Ludwig, 4,618,335, Cl. 474-112.000.
Hershey Foods Corporation: *See*—
Porcelli, Michele L., 4,618,055, Cl. 198-422.000.
Hertlein, Walter G., to Shipley Company Inc. Scanning wedge method for determining characteristics of a photoresist. 4,618,233, Cl. 354-20.000.
Heselton, Fred: *See*—
Dubois, Harvey W.; and Heselton, Fred, 4,618,857, Cl. 340-654.000.
Hesse, Bernhard: *See*—
Becker, Rainer; Jahn, Dieter; Schirmer, Ulrich; Schott, Eberhard P.; Hesse, Bernhard; and Jung, Johann, 4,618,362, Cl. 71-88.000.
Hesston Corporation: *See*—
Fell, Ferol S.; and Ratzlaff, Howard J., 4,617,786, Cl. 56-13.400.
Hester, John W.: *See*—
Falgout, Thomas E., Sr.; and Hester, John W., 4,618,010, Cl. 175-329.000.
Hettel, Hans: *See*—
Scholl, Hans-Joachim; and Hettel, Hans, 4,618,706, Cl. 560-335.000.
Hewlett Packard Company: *See*—
Tan, Tun S., 4,618,510, Cl. 427-89.000.
Heyde, Hans H.; and Echeverria, Julio A., to Lorenzetti-Inebrasa S/A. Insulating chamber. 4,618,753, Cl. 200-148.00G.
Hickman, John B., to W. P. Hickman Co. Nailerless roof edge, framing structure and building panel mounting assembly. 4,617,770, Cl. 52-214.000.
Hicks, John W., Jr., to Polaroid Corporation. Method for measuring loop coupling efficiency. 4,618,258, Cl. 356-73.100.
Higa, Osamu: *See*—
Ikeda, Hiroshi; and Higa, Osamu, 4,618,921, Cl. 363-49.000.

Higashino, Takeshi: *See*—
Nohara, Kazunori; Tanmatsu, Katsuo; Hosoya, Nobukazu; and Higashino, Takeshi, 4,618,888, Cl. 358-120.000.
Higgins, William A., to Lubrizol Corporation, The. Aqueous systems containing amino sulfonic acid derivatives of carboxylic acids. 4,618,450, Cl. 252-355.000.
Hilfiker Pipe Co.: *See*—
Hilfiker, William K., 4,618,283, Cl. 405-124.000.
Hilfiker, William K., to Hilfiker Pipe Co. Archway construction utilizing alternating reinforcing mats and fill layers. 4,618,283, Cl. 405-124.000.
Hill, William F., to Lucas Electrical Electronics and Systems Ltd. Electronic ignition system for an internal combustion engine. 4,617,905, Cl. 123-614.000.
Hill, William F., to Lucas Industries, Public Limited Company. Dwell control for an I.C. engine spark ignition system. 4,617,906, Cl. 123-617.000.
Hillert, Gotz: *See*—
von Voithenberg, Hubertus; and Hillert, Gotz, 4,618,643, Cl. 524-430.000.
Hillier, Clyde: *See*—
Roberts, David; and Hillier, Clyde, 4,618,200, Cl. 339-75.00P.
Hillman, Jerry L.: *See*—
Knapp, Janet S.; and Hillman, Jerry L., 4,617,796, Cl. 60-39.790.
Hilmersson, Anders: *See*—
Nygren, Jan; and Hilmersson, Anders, 4,617,779, Cl. 53-433.000.
Hilton-Davis Chemical Co., The: *See*—
Schmidt, Paul J.; and Hung, William M., 4,618,684, Cl. 548-455.000.
Himmele, Walter: *See*—
Muench, Volker; Hambrecht, Juergen; Himmele, Walter; Echte, Adolf; and Swoboda, Johann, 4,618,668, Cl. 528-215.000.
Hindman, David B.; Paduchowski, James S.; and Lima, Joseph D., to French Systems, Inc. Method for stabilizing the relationship between the filtering unit and a filter feed pump. 4,618,431, Cl. 210-741.000.
Hinds, John K., to General Electric Company. Automatic machining using constructive solid geometry with Boolean combinations of primitives including tool offsets to form a machining pattern. 4,618,924, Cl. 364-191.000.
Hino, Mitsuo: *See*—
Miyagi, Yoshimitsu; Hino, Mitsuo; and Eto, Takehiko, 4,618,382, Cl. 148-415.000.
Hinooka, Nobuya: *See*—
Yatsu, Tadao; and Hinooka, Nobuya, 4,618,386, Cl. 156-242.000.
Hirai, Yutaka: *See*—
Munakata, Hirohide; Tomida, Yoshinori; Haruta, Masahiro; Hirai, Yutaka; Nishimura, Yukuo; and Hamamoto, Takashi, 4,618,561, Cl. 430-156.000.
Hiramatsu, Akira: *See*—
Akashi, Akira; Ishizaki, Akira; Hiramatsu, Akira; Suda, Yasuo; and Ohtaka, Keiji, 4,618,236, Cl. 354-406.000.
Hirano, Masahiro; and Miyauchi, Toshio, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of accelerating radiative transfer. 4,617,870, Cl. 110-323.000.
Hirano, Yutaka; Inoue, Kazuo; and Yasuhara, Seishi, to Diesel Kiki Co., Ltd. Apparatus for controlling fuel injection timing of fuel injection apparatus. 4,617,902, Cl. 123-501.000.
Hirata, Akira: *See*—
Kokubo, Eiichi; and Hirata, Akira, 4,618,302, Cl. 414-33.000.
Hirata, Tadashi; Saito, Hiromitsu; and Morimoto, Makoto, to Kyowa Hakko Kogyo Co., Ltd. Cyclopentenone compound and process for production thereof. 4,618,687, Cl. 549-396.000.
Hirose, Iwao: *See*—
Miyasaka, Eiji; Hirose, Iwao; Yamashita, Koji; Kawai, Kenji; and Kanada, Eiji, 4,618,255, Cl. 355-71.000.
Hirose, Kikuzi: *See*—
Nakamura, Motoharu; Hirose, Kikuzi; and Sakamoto, Tooru, 4,618,377, Cl. 148-6.15R.
Hirose, Takao: *See*—
Uemura, Seiichi; Hirose, Takao; Shohda, Yoshio; Sakamoto, Takayoshi; and Katoh, Kenji, 4,618,463, Cl. 264-29.200.
Hirose, Yoshihisa: *See*—
Ando, Junji; and Hirose, Yoshihisa, 4,618,019, Cl. 180-219.000.
Hirota, Akira; and Tsushima, Takuya, to Victor Company of Japan, Ltd. Noise reducing system for video signal. 4,618,893, Cl. 358-167.000.
Hirt, Walter; and Futterknecht, Fritz, to Emhart Industries, Inc. Moving means for use in a glassware manufacturing machine. 4,618,356, Cl. 65-173.000.
Hisajima, Masahiko; Shigemura, Yutaka; Makiura, Yoshinori; and Ishito, Mitsuya, to Mita Industrial Co., Ltd. Copying machine with a variable magnification device. 4,618,252, Cl. 355-55.000.
Hispano-Suiza: *See*—
Allais, Jean-Philippe P. B.; and Tremouilles, Francis J. M. G., 4,617,852, Cl. 89-36.130.
Hitachi Automotive Engineering Co., Ltd.: *See*—
Mashino, Keiichi; Satou, Morio; Masumoto, Shouji; Kobayashi, Kunio; and Miki, Osamu, 4,618,811, Cl. 322-28.000.
Hitachi Koki Co.: *See*—
Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, 4,618,868, Cl. 346-75.000.
Hitachi, Ltd.: *See*—
Fukushima, Toshihiko; Miyamoto, Seigo; Sayo, Kosaku; and Emi, Kenji, 4,617,804, Cl. 62-212.000.
Fukushima, Toshihiko; Miyamoto, Seigo; Fujita, Masahiko; Musoo, Masanori; and Sayo, Kosaku, 4,618,092, Cl. 236-92.00B.
Fukuyori, Kazusige, 4,617,818, Cl. 72-379.000.
Kato, Kazuo; and Sato, Hideo, 4,618,814, Cl. 323-280.000.
Kubo, Kanji; Wada, Kenichi; and Shintani, Yooichi, 4,618,926, Cl. 364-200.000.
Mashino, Keiichi; Satou, Morio; Masumoto, Shouji; Kobayashi, Kunio; and Miki, Osamu, 4,618,811, Cl. 322-28.000.
Miura, Haruo; Nagaoka, Takashi; Abe, Yoshiaki; and Sakata, Souji, 4,618,311, Cl. 415-149.00R.
Nawata, Makoto; Fukuyama, Ryoji; Nakazato, Norio; and Nishiumi, Masaharu, 4,618,398, Cl. 156-643.000.
Nishimiya, Torazo; Ito, Tomoo; and Iseyama, Takashi, 4,617,889, Cl. 123-339.000.
Sasano, Akira; Seki, Kouichi; Yamamoto, Hideaki; Baji, Toru; and Tsukada, Toshihisa, 4,618,873, Cl. 357-23.700.
Shimizu, Isao; and Yamada, Kazuji, 4,618,397, Cl. 156-628.000.
Shizuka, Masayuki; and Yamada, Shigeki, 4,618,793, Cl. 310-232.000.
Tabata, Kuniaki; and Takeda, Haruo, 4,618,991, Cl. 382-46.000.
Takahashi, Yukio; Shimazoe, Michitaka; and Matsuoka, Yoshitaka, 4,618,844, Cl. 338-2.000.
Tokuyama, Shunji; Suzuki, Koji; and Arimatsu, Keiji, 4,618,905, Cl. 361-4.000.
Ueno, Masahiro; Tashiro, Korefumi; and Toyota, Eiichi, 4,618,930, Cl. 364-426.000.
Wakashima, Yoshikazu; and Shimada, Sachio, 4,618,406, Cl. 204-181.100.
Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, 4,618,868, Cl. 346-75.000.
Hitachi Maxell, Ltd.: *See*—
Morioka, Akira; Matsuura, Takeshi; and Takahira, Yoshiyuki, 4,618,536, Cl. 428-329.000.
Hitachi Seiko Ltd.: *See*—
Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, 4,618,868, Cl. 346-75.000.
Hitco: *See*—
Lay, Khin M.; Palguta, Stephen E.; Fernandez, Ramon B.; and Cabalquinto, Santiago C., 4,617,716, Cl. 29-526.00R.
Hitomi, Mitsuo: *See*—
Sasaki, Junzo; Hitomi, Mitsuo; and Kazuhiko, Ueda, 4,617,897, Cl. 123-432.000.
Hittel, William C., to International Playtex, Inc. Brassiere frame. 4,617,934, Cl. 128-425.000.
Ho, W. S. Winston: *See*—
Heinzelmann, Fred J.; Rothblatt, Noah S.; Glass, James P., Jr.; Say, Geoffrey R.; Chludzinski, George R.; Sartori, Guido; and Ho, W. S. Winston, 4,618,481, Cl. 423-228.000.
Hobson, Philip B.; and Keay, Robert E., to FMC Corporation. Water aided catechol etherification. 4,618,728, Cl. 568-652.000.
Hochiki Corporation: *See*—
Yuchi, Sadataka, 4,618,853, Cl. 340-505.000.
Hodgkins, David, to Stanadyne, Inc. Disposable fuel filter/water separator element. 4,618,423, Cl. 210-305.000.
Hoechst Aktiengesellschaft: *See*—
Hengel, Rolf, 4,618,641, Cl. 524-284.000.
Linkies, Adolf; and Reuschling, Dieter, 4,618,455, Cl. 260-543.00F.
Mohr, Dieter; and Frass, Werner, 4,618,405, Cl. 204-129.750.
Neeb, Rudolf; Ironich, Wolfgang; and Volk, Heinrich, 4,618,701, Cl. 560-139.000.
Vertesy, Laszlo ; Bender, Rudolf; and Fehlhaber, Hans-Wolfram, 4,618,602, Cl. 514-54.000.
Hoefer, Peter: *See*—
Baron, Heinz; Hoefer, Peter; and Schwind, Herbert, 4,618,228, Cl. 351-161.000.
Hoeg, Wolfgang: *See*—
Steinke, Gerhard; Fels, Peter; Hoeg, Wolfgang; Lorenz, Werner; Ahnert, Wolfgang; Steffen, Frank; and Reichardt, Walter, 4,618,987, Cl. 381-82.000.
Hoening, Brian T., to Central Sprinkler Corporation. Sprinkler head with electrical sensor. 4,618,001, Cl. 169-23.000.
Hoffmann, Martin, to Werner H. K. Peters Maschinenfabrik GmbH. One-sided corrugated cardboard machine with suction device. 4,618,394, Cl. 156-473.000.
Hofmann, Hans P.: *See*—
Schlecker, Rainer; Schmidt, Peter; Thieme, Peter C.; Lenke, Dieter; Teschendorf, Hans-Jurgen; Traut, Martin; Mueller, Claus D.; Hofmann, Hans P.; and Kreiskott, Horst, 4,618,622, Cl. 514-457.000.
Hofmann-Igl, Ernest, to Basotherm GmbH. Scalp applicator. 4,617,949, Cl. 132-88.500.
Hofmann, Karl; Mladek, Walter; and Kaczynski, Bernhard, to Robert Bosch GmbH. Fuel injection nozzle for internal combustion engines. 4,618,097, Cl. 239-124.000.
Hoglund, Carl. Cam controlled machine for forming non-standard surfaces. 4,617,762, Cl. 51-101.00R.
Hohberg, Gerhard: *See*—
Muller, Gerhard; Hohberg, Gerhard; and Greve, Peter, 4,618,759, Cl. 219-121.0LR.
Holehouse, Joseph G.: *See*—
Grimm, Robert A.; Kyung, Jai H.; Brusky, Phyllis L.; Holehouse, Joseph G.; and Chang, Biau-hung, 4,618,707, Cl. 560-337.000.
Holland, Linda L. Grooming and treatment applicator. 4,617,875, Cl. 119-85.000.
Hollinshead, Clive; and Willbanks, Marion A. Liquid storage tank moisture filter. 4,618,419, Cl. 210-167.000.

Hollos, Gyorgy: *See*—
Pal, Gabor; Endroczi, Gabor; Hollos, Gyorgy; Nagy, Gabor; Szonyi, Gabor; Bodi Laszlo ; and Balazs, Zoltan, 4,617,830, Cl. 73-590.000.
Holmberg, Albert E., to Holmberg Company, The. Prefabricated bindable sheet. 4,618,520, Cl. 428-131.000.
Holmberg Company, The: *See*—
Holmberg, Albert E., 4,618,520, Cl. 428-131.000.
Holroyd, Colin: *See*—
McGlashen, James N.; and Holroyd, Colin, 4,618,466, Cl. 264-40.600.
Holt, Jan D.: *See*—
Dugge, Richard H.; and Holt, Jan D., 4,618,295, Cl. 406-138.000.
Holter, Warren G.; and Van Laanen, Lawrence V., to Siemens-Allis, Inc. Method of making multiple-element strap winding for rotor pole. 4,617,725, Cl. 29-598.000.
Holtslander, Roger A., to Wolf Engineering Corporation. Multiple phase switching circuit and heat sink structure. 4,618,817, Cl. 323-322.000.
Holzman, James W.: *See*—
Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, 4,618,067, Cl. 220-1.500.
Homco International Inc.: *See*—
Carter, Thurman B.; Reynolds, Carl D.; and Mundorf, Larry R., 4,618,009, Cl. 175-267.000.
Honda Giken Kogyo K.K.: *See*—
Otobe, Yutaka; and Yamato, Akihiro, 4,617,901, Cl. 123-489.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ando, Junji; and Hirose, Yoshihisa, 4,618,019, Cl. 180-219.000.
Ashikawa, Noboru; and Sakuma, Shunji, 4,618,021, Cl. 180-248.000.
Kimura, Ryoichi; Nomura, Kanji; Ubukata, Kazumi; and Kasahara, Shinju, 4,618,132, Cl. 296-97.00J.
Kishida, Eiji; and Hasegawa, Shumpei, 4,617,891, Cl. 123-344.000.
Kobayashi, Hideo; and Kishida, Eiji, 4,617,900, Cl. 123-489.000.
Matsumoto, Yutaka, 4,617,882, Cl. 123-90.310.
Miyatake, Satoshi; Abe, Mitsuo; and Kume, Masao, 4,617,761, Cl. 51-95.0GH.
Nagase, Hidenobu; and Umemoto, Atsushi, 4,617,887, Cl. 123-279.000.
Nakajima, Tetsuo, 4,617,899, Cl. 123-487.000.
Nishikawa, Masao; Sakai, Shinzo; and Miyake, Junichi, 4,618,037, Cl. 192-3.300.
Noda, Azusa; and Kamiya, Tadashi, 4,618,020, Cl. 180-229.000.
Okuyama, Takahiro; Toki, Susumu; and Ishihara, Masahito, 4,617,883, Cl. 123-90.440.
Otobe, Yutaka; and Kiuchi, Takeo, 4,618,954, Cl. 371-16.000.
Toshimitsu, Yoshihiko; Takaoka, Tokuro; Kawai, Toshitake; and Ishida, Takashi, 4,618,018, Cl. 180-142.000.
Honda, Michitaka; and Kikuchi, Katsuya, to Tokyo Shibaura Denki Kabushiki Kaisha. Data processing apparatus for producing X-ray images with improved signal to noise ratio. 4,618,928, Cl. 364-414.000.
Honeywell Inc.: *See*—
Hartranft, Marc D.; and Hendrickson, Thomas E., 4,618,922, Cl. 363-127.000.
Honeywell Information Systems Italia: *See*—
Salvagno, Elvio; and Piacentino, PierLuigi, 4,618,820, Cl. 324-158.00F.
Honma, Minoru; Hattori, Toshihiro; Saito, Hideo; and Ishihara, Masaki, to Isuzu Motors Limited. Apparatus for maintaining vehicle braking force. 4,618,040, Cl. 192-0.090.
Hoogovens Groep B.V.: *See*—
Jansse, Leonard, 4,618,368, Cl. 75-53.000.
Horn, Klaus, to Siemens Aktiengesellschaft. Evaluation circuits for passive measurement-variable pickups. 4,618,818, Cl. 324-62.000.
Horner, John A. Method and apparatus for sensing average temperature. 4,618,268, Cl. 374-115.000.
Hornung, Friedrich, to Robert Bosch GmbH. Device for regulating rotary speed of an alternating current electric motor. 4,618,805, Cl. 318-245.000.
Horodysky, Andrew G., to Mobil Oil Corporation. Multifunctional lubricant additives and compositions thereof. 4,618,436, Cl. 252-325.000.
Horodysky, Andrew G., to Mobil Oil Company. Multifunctional friction-modifying additives and compositions thereof. 4,618,437, Cl. 252-32.500.
Horsch, Wilfried, to GTE Valeron Corporation. Interchangeable tool head for a nc machine. 4,617,846, Cl. 82-1.200.
Horst, Robert W., to Tandem Computers Incorporated. Method of operating enhanced alu test hardware. 4,618,956, Cl. 371-68.000.
Horvath, Stephan; and Bernasconi, Carlo, to Gretag Aktiengesellschaft. Digital speech processing system having reduced encoding bit requirements. 4,618,982, Cl. 381-36.000.
Horwath, Ronald S.: *See*—
Babu, Suryadevara V.; Horwath, Ronald S.; Lu, Neng-hsing; and Welsh, John A., 4,618,477, Cl. 422-186.290.
Horwitz, Bruce A., to Itek Corporation. Method of fabricating a controlled harmonic binary grating. 4,618,214, Cl. 350-162.200.
Hoshi, Nobuya: *See*—
Ohashi, Tamaki; Suzuki, Tsunefusa; Nakada, Kaoru; Hoshi, Nobuya; Fujimura, Hisao; and Ui, Hiromitu, 4,617,831, Cl. 74-10.330.
Hoshizaki Electric Co., Ltd.: *See*—
Sakai, Tadashi; and Naruse, Nobutaka, 4,617,806, Cl. 62-347.000.
Hosoya, Eikichi: *See*—
Okuda, Hiromichi; Masuno, Hiroshi; Aburada, Masaki; Takeda, Shigefumi; Itoh, Eiko; Matsushita, Moe; and Hosoya, Eikichi, 4,618,495, Cl. 424-195.100.
Hosoya, Nobukazu: *See*—
Nohara, Kazunori; Tanmatsu, Katsuo; Hosoya, Nobukazu; and Higashino, Takeshi, 4,618,888, Cl. 358-120.000.
Hostetter, John L. Weeder-cultivator. 4,618,003, Cl. 172-25.000.
Howard, Cecil J. Method and apparatus for building borders. 4,618,004, Cl. 172-176.000.
Hower, Larry H., to Hart Group, The. Electronic stethoscope. 4,618,986, Cl. 381-67.000.
Howser, M. Gene, to Production Systems, Inc. Chain-link belt conveyor with adjustable parallel offset and variable radius guide. 4,618,057, Cl. 198-861.200.
Hrebenar, Kevin R.: *See*—
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; and Deal, James F., III, 4,618,348, Cl. 44-51.000.
Hsi, Peter H. Y. Notebook construction. 4,618,166, Cl. 281-15.00R.
Hsu, Ming-ta S.: *See*—
Parker, John A.; Heimbuch, Alvin H.; Hsu, Ming-ta S.; and Chen, Timothy S., 4,618,652, Cl. 525-282.000.
Huang, Jamin, to Union Carbide Corporation. Alpha-heterocyclic carbinol phosphates. 4,618,603, Cl. 514-80.000.
Huckaby, James E., to Shuf-Kut, Inc. Pipe cutting templet. 4,618,378, Cl. 148-9.600.
Huckle, Ralph E., to De La Rue Systems Limited. Injection moulded shutter. 4,618,070, Cl. 220-350.000.
Hudson, Carl W.; and Hamner, Glen P., to Exxon Research and Engineering Co. Hydrocracking process. 4,618,412, Cl. 208-59.000.
Hudson, James F.: *See*—
Yee, Harold H.; and Hudson, James F., 4,618,840, Cl. 333-105.000.
Hudson, John H., Jr.: *See*—
Vecchio, Anthony J.; and Hudson, John H., Jr., 4,618,415, Cl. 209-134.000.
Hudson, John O.; Schleien, Mickey M.; and Barrett, John, to Purex Corporation. Household laundry detergent with dual strength bleach. 4,618,444, Cl. 252-92.000.
Hudson, Wilbur G.: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; and Beeland, William D., 4,617,862, Cl. 100-53.000.
Huebner, David J.: *See*—
Bauman, Therese M.; and Huebner, David J., 4,618,645, Cl. 524-745.000.
Huggins, Orville C.: *See*—
Golicz, Roman M.; Seniff, Dana W.; Fogle, Ronald L.; and Huggins, Orville C., 4,617,784, Cl. 53-540.000.
Hughes Aircraft Company: *See*—
Weigel, Wolfgang, 4,618,768, Cl. 250-334.000.
Yee, Harold H.; and Hudson, James F., 4,618,840, Cl. 333-105.000.
Hunadi, Ronald O.: *See*—
Baum, Kurt; Hunadi, Ronald O.; and Bedford, Clifford D., 4,618,734, Cl. 570-136.000.
Hung, William M.: *See*—
Schmidt, Paul J.; and Hung, William M., 4,618,684, Cl. 548-455.000.
Hunt X-ACTO, Inc.: *See*—
Silverstein, Sidney, 4,617,735, Cl. 30-151.000.
Hunter, Norman R.: *See*—
Gesser, Hyman D.; Hunter, Norman R.; and Morton, Lawrence, 4,618,732, Cl. 568-910.500.
Hurd, Bruce; and Oda, Robert, to AccuSwing, Incorporated. Bowling glove. 4,618,147, Cl. 273-54.00B.
Hutson, Clifford L.; and Miller, Leonidas C., to Hutson, Clifford L. Hand held vacuum actuated pickup instrument. 4,618,178, Cl. 294-64.100.
Hydromatik: *See*—
Wagenseil, Ludwig: and Merkle, Walter, 4,617,853, Cl. 91-505.000.
I.S.A.P. Spa (Industrie Specializzate Articoli Plastici): *See*—
Padovani, Pietro, 4,617,748, Cl. 40-312.000.
Ichijima, Seiji; Usui, Hideo; and Deguchi, Naoyasu, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,618,571, Cl. 430-505.000.
Ichikawa, Toshiji; and Shimizu, Atsushi, to Terumo. Blood collector. 4,617,941, Cl. 128-765.000.
Ichinoi, Yutaka, to Victor Company of Japan, Ltd. Color video signal recording and reproducing apparatus. 4,618,894, Cl. 358-310.000.
Ide, Toshiaki: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; Arioka, Hiroyuki; and Kubota, Yuichi, 4,618,535, Cl. 428-325.000.
Iden, Rudiger; and Seybold, Gunther, to BASF Aktiengesellschaft. Perylene compounds. 4,618,694, Cl. 558-416.000.
Ideta, Yasufumi, to Nissan Motor Co., Ltd. Hydraulic control system for lock-up clutch of torque converter. 4,618,036, Cl. 192-3.300.
Igarashi, Osamu, to Nikko Kogyo Kabushiki Kaisha. Circuit test clip. 4,618,208, Cl. 339-200.00P.
Iida, Takao: *See*—
Hashizume, Kazuko; Kase, Hiroshi; Kitamura, Shigeto; Iida, Takao; Shirahata, Kunikatsu; Omori, Kenji; and Shuto, Katsuichi, 4,618,613, Cl. 514-312.000.
Iida, Tetsuya; and Tanaka, Fuminari, to Tokyo Shibaura Denki Kabushiki Kaisha. C-R type D/A converter. 4,618,847, Cl. 340-347.0DA.

Iijima, Shigeharu: *See—*
Takano, Katsuhiko; Iijima, Shigeharu; Yoshihara, Satoshi; Matsushima, Masaaki; Kishi, Hiroyoshi; and Sasamori, Eizo, 4,618,537, Cl. 428-336.000.
Iizuka, Tetsuya: *See—*
Sakurai, Takayasu; and Iizuka, Tetsuya, 4,618,945, Cl. 365-189.000.
Ikari, Kazuo; and Fujii, Toru, to Olympus Optical Co., Ltd. Finder optical system for cameras. 4,618,234, Cl. 354-225.000.
Ikeda, Akira; Nakayama, Shigeki; Ishii, Toshitsugu; and Itakura, Isao, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for plant cultivation. 4,617,755, Cl. 47-65.000.
Ikeda, Hiroshi; and Higa, Osamu, to Kabushiki Kaisha Toshiba. Power supply system and a starting method thereof. 4,618,921, Cl. 363-49.000.
Ikeda, Yoshiaki, to Fanuc Ltd. Graphic display unit. 4,618,859, Cl. 340-724.000.
Ikemura, Akio; and Kajiki, Minoru, to Yoshida Kogyo K. K. Air conditioner system for building. 4,617,805, Cl. 62-259.100.
Ikoma, Keiichi; and Katayama, Syuji, to Sharp Kabushiki Kaisha. Power-off detection circuit for an electronic apparatus. 4,618,780, Cl. 307-130.000.
Illers, Karl H.: *See—*
Muench, Volker; Hambrecht, Juergen; Naarmann, Herbert; Echte, Adolf; and Illers, Karl H., 4,618,636, Cl. 524-176.000.
Taubitz, Christof; Muench, Volker; Hambrecht, Juergen; Echte, Adolf; and Illers, Karl H., 4,618,633, Cl. 524-80.000.
Illinois Tool Works Inc.: *See—*
Bury, George J., 4,618,915, Cl. 361-400.000.
Ilxo Unican Corp.: *See—*
Fish, Aaron M.; D'Intino, Adamo M.; Moessner, Frank G.; and Mazoff, Stanley S., 4,617,810, Cl. 70-14.000.
Imai, Makoto: *See—*
Yokoyama, Meiso; Takahashi, Makoto; Nishiwaki, Tsunehiko; and Imai, Makoto, 4,617,821, Cl. 73-23.000.
Imaizumi, Hiroyuki: *See—*
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,618,606, Cl. 514-202.000.
Imatron, Inc.: *See—*
Rand, Roy E.; Mitchell, John W. J.; and Couch, John L., 4,618,970, Cl. 378-10.000.
Imazeki, Kazuyoshi; Tanaka, Toshiyuki; and Miyakoshi, Hiromichi, to General Research of Electronics, Inc. Portable transceiver. 4,618,997, Cl. 455-76.000.
Immel, Guenther: *See—*
Weiss, Wolfram; Balzer, Wolf-Dieter; Fikentscher, Rolf; Immel, Guenther; and Wolf, Hans, 4,618,371, Cl. 106-263.000.
Immunology Development Corporation: *See—*
Angers, John W., 4,618,494, Cl. 424-101.000.
Imperial Chemical Industries PLC: *See—*
Ballard, Denis G. H.; Moran, Kenneth T.; and Shirley, Ian M., 4,618,454, Cl. 252-500.000.
Gent, Colin W., 4,618,451, Cl. 252-373.000.
Head, Robert A.; and Whyman, Robin, 4,618,628, Cl. 518-700.000.
Rowe, Frederick; and Jackson, Peter N., 4,618,350, Cl. 55-92.000.
Inaba, Takihiro: *See—*
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,618,606, Cl. 514-202.000.
Inada, Taichi. Physical training apparatus. 4,618,145, Cl. 272-146.000.
Incoe Corporation: *See—*
Seres, Alex, 4,617,752, Cl. 43-27.400.
Indiana Mills & Manufacturing, Inc.: *See—*
Anthony, James R.; and Lortz, Allan R., 4,617,705, Cl. 24-642.000.
Industra Products Co. Inc.: *See—*
Walker, Robert G., 4,617,972, Cl. 140-92.100.
Ingersoll, Willard A.; Norquest, Robert C.; and Weber, Richard A., to International Playtex, Inc. Polypropylene wrap end seals and process for making same. 4,617,781, Cl. 53-477.000.
Inoue-Japax Research Incorporation: *See—*
Inoue, Kiyoshi; and Toyoshima, Tatsue, 4,618,761, Cl. 219-517.000.
Inoue, Kazuo: *See—*
Hirano, Yutaka; Inoue, Kazuo; and Yasuhara, Seishi, 4,617,902, Cl. 123-501.000.
Inoue, Kazutoshi: *See—*
Takamiya, Shigeo; Inoue, Kazutoshi; and Tsutaya, Kenzo, 4,618,298, Cl. 405-150.000.
Inoue, Kiyoshi; and Toyoshima, Tatsue, to Inoue-Japax Research Incorporation. Electrode cutting apparatus for wire cut electric discharge machine. 4,618,761, Cl. 219-517.000.
Inoue, Naoyuki: *See—*
Fujimoto, Masakazu; and Inoue, Naoyuki, 4,617,987, Cl. 165-95.000.
Inoue, Shunzo: *See—*
Yanagawa, Hitoshi; Nagasawa, Takeshi; Inoue, Shunzo; Iwaya, Toshio; and Murata, Shinji, 4,618,251, Cl. 355-28.000.
Inoue, Takashi, to Ricoh Company, Ltd. Device for compensating for fluctuation of ink transfer in thermal transfer type printer. 4,618,870, Cl. 346-76.0PH.
Institute po Mebeli I Obzavejdane. *See—*
Sivov, Ferdo A., 4,617,970, Cl. 137-805.000.
International Business Machines Corporation: *See—*
Aipperspach, Anthony G.; Fitzgerald, Joseph M.; and Wu, Philip T., 4,618,943, Cl. 365-104.000.
Babu, Suryadevara V.; Horwath, Ronald S.; Lu, Neng-hsing; and Welsh, John A., 4,618,477, Cl. 422-186.290.
Chappell, Barbara A.; Rajeevakumar, Thekkemadathil V.; Schuster, Stanley E.; and Terman, Lewis M., 4,618,784, Cl. 307-449.000.
Das, Subrata K.; and Dixon, Norman R., 4,618,984, Cl. 381-43.000.
Geldermans, Pieter; and Mathad, Gangadhara S., 4,617,730, Cl. 29-843.000.
Ish-Shalom, Jehuda; Katz, Leonard A.; and Manzer, Dennis G., 4,618,808, Cl. 318-696.000.
Judge, Robert L.; and Wutka, Anthony D., 4,618,292, Cl. 406-19.000.
Lang, Albrecht; and Sakmann, Walter H., 4,618,782, Cl. 307-255.000.
Smith, David A.; and Wells, Oliver C., 4,618,767, Cl. 250-311.000.
International Freezer Corporation: *See—*
Fiedler, Armin, 4,617,802, Cl. 62-125.000.
International Immunoassay Laboratories, Inc.: *See—*
Tsay, Yuh-Geng; and Shah, Vipin D., 4,618,485, Cl. 424-1.100.
International Playtex, Inc.: *See—*
Hittel, William C., 4,617,934, Cl. 128-425.000.
Ingersoll, Willard A.; Norquest, Robert C.; and Weber, Richard A., 4,617,781, Cl. 53-477.000.
Inui, Jun: *See—*
Araki, Kazuhiko; Ao, Hideki; Inui, Jun; and Aihara, Kenichi, 4,618,607, Cl. 514-212.000.
Ipri, Alfred C.: *See—*
Stewart, Roger G.; and Ipri, Alfred C., 4,618,876, Cl. 357-54.000.
Irie, Nobuhiko, to Mitsubishi Jukogyo Kabushiki Kaisha. Tire supplying apparatus. 4,618,303, Cl. 414-226.000.
Ironich, Wolfgang: *See—*
Neeb, Rudolf; Ironich, Wolfgang; and Volk, Heinrich, 4,618,701, Cl. 560-139.000.
Irving, Edward: *See—*
Demmer, Christopher G.; and Irving, Edward, 4,618,564, Cl. 430-270.000.
Isayama, Katsuhiko: *See—*
Kawakubo, Fumio; Takanoo, Miyako; Yukimoto, Sadao; and Isayama, Katsuhiko, 4,618,653, Cl. 525-404.000.
Kawakubo, Fumio; Takanoo, Miyako; Yukimoto, Sadao; and Isayama, Katsuhiko, 4,618,656, Cl. 525-404.000.
Iseyama, Takashi: *See—*
Nishimiya, Torazo; Ito, Tomoo; and Iseyama, Takashi, 4,617,889, Cl. 123-339.000.
Ish-Shalom, Jehuda; Katz, Leonard A.; and Manzer, Dennis G., to International Business Machines Corporation. Electromagnetic actuator system using stepper motor with closed loop position sensing, electronic commutation and dynamic position and anomaly correction. 4,618,808, Cl. 318-696.000.
Ishida Scales Mfg. Co., Ltd.: *See—*
Sashiki, Takashi; and Nakagawa, Yukio, 4,618,011, Cl. 177-1.000.
Ishida, Takashi: *See—*
Toshimitsu, Yoshihiko; Takaoka, Tokuro; Kawai, Toshitake; and Ishida, Takashi, 4,618,018, Cl. 130-142.000.
Ishida, Tokuji; and Hamada, Masataka, to Minolta Camera Kabushiki Kaisha. Focus detecting device for a camera. 4,618,235, Cl. 354-403.000.
Ishiguri, Yukio; Takano, Hirotaka; and Funaki, Yuji, to Sumitomo Chemical Company, Limited. Fungicidal composition. 4,618,620, Cl. 514-383.000.
Ishihara, Masahito: *See—*
Okuyama, Takahiro; Toki, Susumu; and Ishihara, Masahito, 4,617,883, Cl. 123-90.440.
Ishihara, Masaki: *See—*
Hattori, Toshihiro; Ishihara, Masaki; Uriuhara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,618,043, Cl. 192-0.052.
Honma, Minoru; Hattori, Toshihiro; Saito, Hideo; and Ishihara, Masaki, 4,618,040, Cl. 192-0.090.
Ishii, Kazuo: *See—*
Dan, Shigeyuki; Ishii, Kazuo; Kato, Eiichi; and Sera, Hidefumi, 4,618,557, Cl. 430-114.000.
Ishii, Osamu: *See—*
Hatakeyama, Iwao; Maeda, Yasushi; Ishii, Osamu; and Yoshii, Shizuka, 4,618,901, Cl. 360-114.000.
Ishii, Shigeru: *See—*
Maeyama, Tsutomu; Ishii, Shigeru; and Kaneko, Kenji, 4,618,488, Cl. 424-49.000.
Ishii, Toshitsugu: *See—*
Ikeda, Akira; Nakayama, Shigeki; Ishii, Toshitsugu, and Itakura, Isao, 4,617,755, Cl. 47-65.000.
Ishito, Mitsuya: *See—*
Hisajima, Masahiko; Shigemura, Yutaka; Makiura, Yoshinori; and Ishito, Mitsuya, 4,618,252, Cl. 355-55.000.
Ishiwate, Osamu: *See—*
Sato, Noritada; Seki, Yasukazu; and Ishiwate, Osamu, 4,618,381, Cl. 148-189.000.
Ishizaki, Akira: *See—*
Akashi, Akira; Ishizaki, Akira; Hiramatsu, Akira; Suda, Yasuo; and Ohtaka, Keiji, 4,618,236, Cl. 354-406.000.
Isobe, Masahiro; Okazaki, Sumio; and Tanaka, Hideki, to Toyota Jidosha Kabushiki Kaisha. Belt stretching mechanism. 4,618,336, Cl. 474-133.000.
Isovolta Oesterreichische Isolierstoffwerke AG: *See—*
Fialla, Peter, 4,618,699, Cl. 560-86.000.

Isuzu Motors Limited: *See—*
Hattori, Toshihiro; Ishihara, Masaki; Uriuhara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,618,043, Cl. 192-0.052.
Honma, Minoru; Hattori, Toshihiro; Saito, Hideo; and Ishihara, Masaki, 4,618,040, Cl. 192-0.090.

Itakura, Isao: *See—*
Ikeda, Akira; Nakayama, Shigeki; Ishii, Toshitsugu; and Itakura, Isao, 4,617,755, Cl. 47-65.000.

Itek Corporation: *See—*
Horwitz, Bruce A., 4,618,214, Cl. 350-162.200.

Ito, Tomoo: *See—*
Nishimiya, Torazo; Ito, Tomoo; and Iseyama, Takashi, 4,617,889, Cl. 123-339.000.

Ito, Toshimitsu: *See—*
Kobayashi, Nobuyuki; and Ito, Toshimitsu, 4,617,890, Cl. 123-339.000.

Itoh, Eiko: *See—*
Okuda, Hiromichi; Masuno, Hiroshi; Aburada, Masaki; Takeda, Shigefumi; Itoh, Eiko; Matsushita, Moe; and Hosoya, Eikichi, 4,618,495, Cl. 424-195.100.

Itoh, Isamu: *See—*
Ono, Mitsunori; Itoh, Isamu; and Mihayashi, Keiji, 4,618,563, Cl. 430-219.000.

ITT Corporation: *See—*
Muzslay, Steven Z., 4,618,196, Cl. 339-17.00C.

ITT Industries, Inc.: *See—*
Backes, Reiner; and Langenkamp, Ulrich, 4,618,788, Cl. 307-603.000.
Freyberger, Laurin C.; Mlynek, Daniel; and Schmidtpott, Friedrich, 4,618,881, Cl. 358-27.000.

Iwahashi, Hiroyuki: *See—*
Nishioka, Yoshiki; Hakaridani, Mitsuhiro; and Iwahashi, Hiroyuki, 4,618,983, Cl. 381-43.000.

Iwai, Hiroji, to Sharp Kabushiki Kaisha. Paper feed control in a printer. 4,618,278, Cl. 400-568.000.

Iwama, Akio; Tasaka, Kentaro; and Kazuse, Yoshitaka, to Nitto Electric Industrial Co., Ltd. Composite membrane and process for producing the same. 4,618,534, Cl. 428-316.600.

Iwasaki, Masashi, to Kanematsu-Gosho, Ltd. Remote control apparatus for opening and shutting a blind. 4,618,804, Cl. 318-16.000.

Iwaya, Toshio: *See—*
Yanagawa, Hitoshi; Nagasawa, Takeshi; Inoue, Shunzo; Iwaya, Toshio; and Murata, Shinji, 4,618,251, Cl. 355-28.000.

IXI Laboratories, Inc.: *See—*
Johnson, Ronald L.; and Sieben, James A., 4,618,897, Cl. 360-15.000.

J. M. Voith GmbH: *See—*
Kuhn, Friedrich, 4,618,105, Cl. 242-56.00R.

Jacksier, Barry H.; and Ollendick, Gary B., to AT&T Teletype Corporation. Adjustable time delay circuit. 4,618,787, Cl. 307-591.000.

Jackson, Joseph F., to Pratt Burnerd International Limited. Jaw changing apparatus. 4,617,721, Cl. 29-568.000.

Jackson, Peter N.: *See—*
Rowe, Frederick; and Jackson, Peter N., 4,618,350, Cl. 55-92.000.

Jacobstein, Benjamin L.; Mestrits, Thomas J.; and Miller, Murray, to Bausch & Lomb Incorporated. Bifocal contact lens. 4,618,229, Cl. 351-161.000.

Jacquet, Xavier: *See—*
Cabany, Pierre; Gardette, Andre; Jacquet, Xavier; Tollis, Aurelio; and Tollis, Fernando, 4,618,757, Cl. 219-60.00R.

Jahn, Dieter: *See—*
Becker, Rainer; Jahn, Dieter; Schirmer, Ulrich; Schott, Eberhard P.; Hesse, Bernhard; and Jung, Johann, 4,618,362, Cl. 71-88.000.

Jahn, William: *See—*
Beck, William R.; Jahn, William; Koltenback, Steven R.; Scharf, Robert M.; and Schwab, Ronald, 4,617,732, Cl. 29-866.000.

Jahnig, Lutz: *See—*
Donner, Bernd; Schultze, Hartmut; and Jahnig, Lutz, 4,617,893, Cl. 123-361.000.

Jahnke, Richard W.; and Woerner, William C., to Lubrizol Corporation, The. Corrosion-inhibiting compositions, and oil compositions containing said corrosion-inhibiting compositions. 4,618,539, Cl. 428-470.000.

Jalics, George: *See—*
Halasa, Adel F.; and Jalics, George, 4,618,650, Cl. 525-105.000.

Jamestown Metal Marine Sales Inc.: *See—*
Hassell, George, 4,617,772, Cl. 52-461.000.

Jandeska, William F., Jr., to General Motors Corporation. Iron powder article having improved toughness. 4,618,473, Cl. 419-11.000.

Jansse, Leonard, to Hoogovens Groep B.V. Method of injection of wire into molten steel and apparatus for uncoiling wire for use in the method. 4,618,368, Cl. 75-53.000.

Jansson, Peter A.: *See—*
Elias, John G.; and Jansson, Peter A., 4,618,937, Cl. 364-518.000.

Jarrett, Phillip: *See—*
Clegg, Gordon A.; and Jarrett, Phillip, 4,618,545, Cl. 429-130.000.

Jaskolski, Stanley V.: *See—*
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,618,971, Cl. 378-34.000.

Jayne, Laurence I. Stair-climbing wheelchair. 4,618,155, Cl. 280-5.280.

Jefferis, Royston; and Steensgaard, Jens, to University of Birmingham, The. Immunoprecipitation assay of immunoglobulins using monoclonal antibodies. 4,618,589, Cl. 436-540.000.

Jennings, Alfred R., Jr., to Mobil Oil Corporation. Foam enhancement of controlled pulse fracturing. 4,617,997, Cl. 166-299.000.

Jeumont-Schneider: *See—*
Defaucheux, Jacques B.; and Guedj, Freddy, 4,618,471, Cl. 376-228.000.

Jog & Lift Development Co.: *See—*
Joseph, Tony, Jr., 4,618,142, Cl. 272-75.000.

Johansson, Hakan. Fishing tackle with a fiber optic light guide as the fishing line. 4,617,751, Cl. 43-17.500.

Johansson, Sven H.; and Nytomt, Jan G., to Saab-Scania Aktiebolag. Ignition unit in the ignition system of an internal combustion engine. 4,617,907, Cl. 123-647.000.

Johnson, Allen L., to RTE Corporation. Quick latch mounting bracket. 4,618,116, Cl. 248-222.100.

Johnson, Charles C.; and Taylor, Larry T., to United States of America, Energy. Liquid chromatography/Fourier transform IR spectrometry interface flow cell. 4,618,769, Cl. 250-338.000.

Johnson, Delbert B.: *See—*
Michel, Dominique; Johnson, Delbert B.; Pages, Jean F.; Foglia, Vincent F. P.; Martin, Jean G. M.; Vache , Michel P.; Sedillot, Francois G.; and Crull, Carroll M., 4,618,286, Cl. 405-208.000.

Johnson & Johnson: *See—*
Brasseur, Raynald, 4,618,496, Cl. 424-195.100.

Johnson, Lorin K.; Atlas, Steven A.; and Laragh, John H., to Biotechnology Research Associates, J.V. Novel polypeptide diuretic/-vasodilators. 4,618,600, Cl. 514-12.000.

Johnson, Mark G., to Thomson Components - Mostek Corporation. Precharge circuit for enhancement mode memory circuits. 4,618,786, Cl. 307-578.000.

Johnson, Richard A.; Antrim, Richard L.; and Lloyd, Norman E., to Nabisco Brands, Inc. Ultrafiltration purification of glucose isomerase. 4,618,584, Cl. 435-234.000.

Johnson, Ronald L.; and Sieben, James A., to IXI Laboratories, Inc. System for synchronizing plural data storage devices to a common master. 4,618,897, Cl. 360-15.000.

Johnson, Thomas A.: *See—*
Ford, Michael E.; and Johnson, Thomas A., 4,618,716, Cl. 564-469.000.

Johnston Pump/General Valve, Inc.: *See—*
Smith, Gordon M., 4,617,964, Cl. 137-625.300.

Joines, William T.: *See—*
Rafal, Marc D.; Burton, Larry W.; and Joines, William T., 4,618,996, Cl. 455-46.000.

Jones, Thomas M.: *See—*
Bratt, Richard G.; Gruner, Ronald H.; Jones, Thomas M.; and Nealon, James T., 4,618,925, Cl. 364-200.000.

Joseph, Tony, Jr., to Jog & Lift Development Co. Jumprope apparatus having weighted bar. 4,618,142, Cl. 272-75.000.

Jude, John L. Easy grip easy scrub soap bar-scrub brush combination. 4,618,443, Cl. 252-92.000.

Judge, Robert L.; and Wutka, Anthony D., to International Business Machines Corporation. Controls for semiconductor wafer orientor. 4,618,292, Cl. 406-19.000.

Jufuku, Yasunobu: *See—*
Okawa, Susumu; and Jufuku, Yasunobu, 4,618,337, Cl. 474-201.000.

Jung, Johann: *See—*
Becker, Rainer; Jahn, Dieter; Schirmer, Ulrich; Schott, Eberhard P.; Hesse, Bernhard; and Jung, Johann, 4,618,362, Cl. 71-88.000.

Jung, Rolf, to Krauss u. Reichert GmbH & Co. KG. Machine for cutting out flat material. 4,617,737, Cl. 30-273.000.

Jurek, Julius V. .22 caliber rimfire adapter system for M16 type rifle. 4,617,749, Cl. 42-16.000.

Just, Herbert; and Hansen, Holger, to Autoflug GmbH. Quick release lock for a parachute. 4,618,110, Cl. 244-151.00B.

Justice, David D.: *See—*
Fair, David L.; Justice, David D.; and Kelly, Pilar P., 4,618,403, Cl. 204-98.000.

Kabel-und Metallwerke Gutehoffnungshuette: *See—*
Schmidtchen, Hans-Martin; and Voigt, Hermann U., 4,618,654, Cl. 525-288.000.

Kabushiki Gaisha Waizen: *See—*
Yoshida, Masao, 4,618,523, Cl. 428-189.000.

Kabushiki Kaisha Daini Seikosha: *See—*
Matsuura, Yoshiaki, 4,618,837, Cl. 331-160.000.

Kabushiki Kaisha Daisei Kikai: *See—*
Chikatani, Hajime; and Kawakami, Sanji, 4,617,785, Cl. 53-562.000.

Kabushiki Kaisha Kitai Tekkosho: *See—*
Kitai, Toshio, 4,618,327, Cl. 440-53.000.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Miyagi, Yoshimitsu; Hino, Mitsuo; and Eto, Takehiko, 4,618,382, Cl. 148-415.000.

Kabushiki Kaisha Meidensha: *See—*
Tsukune, Hideo; and Goto, Keisuke, 4,618,989, Cl. 382-25.000.

Kabushiki Kaisha Morita Seisakusho: *See—*
Kataoka, Kenzo; and Watanabe, Hiroo, 4,617,837, Cl. 74-785.000.

Kabushiki Kaisha Toshiba: *See—*
Aoyama, Masaharu; Abe, Masahiro; Ajima, Takashi; and Yonezawa, Toshio, 4,618,878, Cl. 357-71.000.
Araki, Youichi; and Uetake, Yoshinari, 4,618,877, Cl. 357-56.000.
Fukushi, Yukihiro; and Segawa, Hiroyuki, 4,618,245, Cl. 355-14.0SH.
Ikeda, Hiroshi; and Higa, Osamu, 4,618,921, Cl. 363-49.000.
Kimura, Tokuji; and Urushihara, Toshio, 4,618,085, Cl. 225-100.000.
Koyama, Katsuhide, 4,618,979, Cl. 378-176.000.
Watanabe, Junji, 4,618,244, Cl. 355-8.000.
Yamada. Tetsuo, 4,618,874, Cl. 357-30.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Fujitani, Yoshiyasu; Muraki, Hideaki; Yokota, Koji; Sobukawa, Hideo; and Matsunaga, Shinichi, 4,617,794, Cl. 60-274.000.

Kabushiki Kaisha Universal: *See*—
Kimura, Yutaka, 4,618,150, Cl. 273-143.00R.

Kaczmarski, Edward Z.: *See*—
Andrews, Patrick V.; and Kaczmarski, Edward Z., 4,618,084, Cl. 225-96.000.

Kaczorowski, Edward M.: *See*—
Maydan, Dan; Somekh, Sasson; and Kaczorowski, Edward M., 4,618,262, Cl. 356-357.000.

Kaczynski, Bernhard: *See*—
Hofmann, Karl; Mladek, Walter; and Kaczynski, Bernhard, 4,618,097, Cl. 239-124.000.

Kadaba, Pankaja K., to University of Kentucky Research Foundation, The. Aryl substituted 1H-4,5-dihydro-1,2,3-triazoles as anticonvulsants. 4,618,681, Cl. 546-276.000.

Kadowaki, Takashi; and Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic materials. 4,618,570, Cl. 430-505.000.

Kagata, Tooru: *See*—
Fujikawa, Motoi; and Kagata, Tooru, 4,618,044, Cl. 192-54.000.

Kageyama, Hidehei, to Toyo Polymer Co., Ltd.; and Kotobuki & Co., Ltd. Push-button writing instrument with front seal means. 4,618,280, Cl. 401-107.000.

Kagiura, Kazuo: *See*—
Sakurai, Masaaki; and Kagiura, Kazuo, 4,618,240, Cl. 355-3.0FU.

Kagiyama, Tsutomu; Kobayashi, Fumio; Yamagishi, Jun; and Nishikawa, Hiromitsu, to Ohi Seisakusho Co., Ltd. Sliding door opening-closing mechanism. 4,617,757, Cl. 49-280.000.

Kajiki, Minoru: *See*—
Ikemura, Akio; and Kajiki, Minoru, 4,617,805, Cl. 62-259.100.

Kajita, Shunsuke: *See*—
Kobayashi, Shinma; and Kajita, Shunsuke, 4,617,986, Cl. 165-42.000.

Kajiwara, Tadashi; Sato, Akira; Tsurumaru, Shinobu; and Kumamoto, Kenichiro, to Sony Corporation. Impedance adjusting element for a microstrip circuit. 4,618,838, Cl. 333-33.000.

Kakino, Mitsuteru, to Kakino, Mitsuteru. Flat cathode ray tube. 4,618,801, Cl. 313-495.000.

Kakuda, Yoshitaka; and Kondoh, Norimasa, to Matsushita Electric Industrial Co., Ltd. Axial air gap motor. 4,618,790, Cl. 310-90.000.

Kaltenbach & Voigt GmbH & Co.: *See*—
Schmidt, Helmut; Bodenmiller, Anton; and Straka, Alfred, 4,618,326, Cl. 433-79.000.

Kamens, Bruce H.; and Ritter, George E., to Timex Corporation. Acoustic alarm setting device for a timepiece. 4,618,264, Cl. 368-74.000.

Kamiya, Sadayoshi: *See*—
Ohnishi, Yasuhiko, 4,618,664, Cl. 527-300.000.

Kamiya, Tadashi: *See*—
Noda, Azusa; and Kamiya, Tadashi, 4,618,020, Cl. 180-229.000.

Kampichler, Guenter, to Motorenfabrik Hatz GmbH & Co. KG. Governor mechanism counterbalance for a fuel injected internal combustion engine of a vehicle. 4,617,894, Cl. 123-372.000.

Kanada, Eiji: *See*—
Miyasaka, Eiji; Hirose, Iwao; Yamashita, Koji; Kawai, Kenji; and Kanada, Eiji, 4,618,255, Cl. 355-71.000.

Kanbara, Youichi: *See*—
Ogawa, Takahiro; Takada, Masahiko; Matsumoto, Takaharu; and Kanbara, Youichi, 4,618,469, Cl. 264-182.000.

Kane, Johji, to Matsushita Electric Industrial Co., Ltd. Tuning systems on dielectric substrates. 4,619,001, Cl. 455-192.000.

Kanegafuchi Chemical Industry Co., Ltd.: *See*—
Kawakubo, Fumio; Takanoo, Miyako; Yukimoto, Sadao; and Isayama, Katsuhiko, 4,618,653, Cl. 525-404.000.
Kawakubo, Fumio; Takanoo, Miyako; Yukimoto, Sadao; and Isayama, Katsuhiko, 4,618,656, Cl. 525-404.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Nakagawa, Masao, 4,618,663, Cl. 526-232.300.

Kanegafuchi Kaguku Kogyo Kabushiki Kaisha: *See*—
Ogawa, Takahiro; Takada, Masahiko; Matsumoto, Takaharu; and Kanbara, Youichi, 4,618,469, Cl. 264-182.000.

Kaneko, Kenji: *See*—
Maeyama, Tsutomu; Ishii, Shigeru; and Kaneko, Kenji, 4,618,488, Cl. 424-49.000.

Kanematsu-Gosho, Ltd.: *See*—
Iwasaki, Masashi, 4,618,804, Cl. 318-16.000.

Kanematu, Tetuo; and Yamaguchi, Yoshiaki, to Daicel Chemical Industries Ltd. Stable gel composition containing a carboxymethyl cellulose salt and a process for the preparation of them. 4,618,491, Cl. 424-81.000.

Kania, Charles M.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Low molecular weight acrylic polymers. 4,618,659, Cl. 525-455.000.

Kanmoto, Yoshiaki: *See*—
Shibata, Isamu; and Kanmoto, Yoshiaki, 4,618,958, Cl. 372-29.000.

Kantor, Frederick W. Fluid transport and processing system. 4,618,421, Cl. 210-170.000.

Karaki, Shintaro: *See*—
Sakabe, Yukio; Karaki, Shintaro; and Nakano, Kiyoshi, 4,618,912, Cl. 361-309.000.

Karla, Heinz, to Saint Gobain Vitrage. Process for soldering a current connecting element and a current feed conductor of a heatable glass pane. 4,618,088, Cl. 228-124.000.

Kasahara, Shinju: *See*—
Kimura, Ryoichi; Nomura, Kanji; Ubukata, Kazumi; and Kasahara, Shinju, 4,618,132, Cl. 296-97.00J.

Kasai, Hitoshi: *See*—
Hattori, Toshihiro; Ishihara, Masaki; Uriuhara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,618,043, Cl. 192-0.052.

Kasai, Kazumi, to Nippon Notion Kogyo Co., Ltd. Swivel snap hook of synthetic resin. 4,617,704, Cl. 24-236.000.

Kasai Kogyo Co., Ltd.: *See*—
Nakamura, Haruo, 4,617,699, Cl. 16-262.000.

Kase, Hiroshi: *See*—
Hashizume, Kazuko; Kase, Hiroshi; Kitamura, Shigeto; Iida, Takao; Shirahata, Kunikatsu; Omori, Kenji; and Shuto, Katsuichi, 4,618,613, Cl. 514-312.000.

Kashioka, Motohiko: *See*—
Ohashi, Masato; Kashioka, Motohiko; Tamura, Shinichi; Katsura, Hiromitsu; Ueda, Hideaki; and Nakamura, Akihiro, 4,618,554, Cl. 430-78.000.

Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Wheel stopping device. 4,618,033, Cl. 188-20.000.

Katagi, Takashi: *See*—
Makino, Shigeru; Katagi, Takashi; Urasaki, Shuji; Kawabata, Shunichiro; and Kobayashi, Yuji, 4,618,866, Cl. 343-779.000.

Kataoka, Kenzo; and Watanabe, Hiroo, to Kabushiki Kaisha Morita Seisakusho. Speed change device for medical handpiece. 4,617,837, Cl. 74-785.000.

Katayama, Syuji: *See*—
Ikoma, Keiichi; and Katayama, Syuji, 4,618,780, Cl. 307-130.000.

Katchko, John; Plaisance, Thomas H.; and Kriz, Karel, to DeSoto, Inc. Heat curable polysiloxane release coatings which stratify when baked and paper coated therewith. 4,618,657, Cl. 525-443.000.

Kato, Eiichi: *See*—
Dan, Shigeyuki; Ishii, Kazuo; Kato, Eiichi; and Sera, Hidefumi, 4,618,557, Cl. 430-114.000.

Kato, Hideaki; and Oohashi, Kaoru, to Nippondenso Co., Ltd.; and Toyota Jidosha Kabushiki Kaisha. Vehicle height control system. 4,618,156, Cl. 280-6.00R.

Kato, Kazuo; and Sato, Hideo, to Hitachi, Ltd. Voltage-to-current converter circuit. 4,618,814, Cl. 323-280.000.

Kato, Masatake, to Canon Kabushiki Kaisha. Telephoto zoom lens. 4,618,220, Cl. 350-427.000.

Kato, Michio: *See*—
Sada, Masao; Kato, Michio; Ayano, Masami; Abe, Tadashi; and Moriwaki, Masanori, 4,618,709, Cl. 562-532.000.

Katoh, Kenji: *See*—
Uemura, Seiichi; Hirose, Takao; Shohda, Yoshio; Sakamoto, Takayoshi; and Katoh, Kenji, 4,618,463, Cl. 264-29.200.

Katsube, Ryoji: *See*—
Kouyama, Toshitake; and Katsube, Ryoji, 4,618,890, Cl. 358-149.000.

Katsura, Hiromitsu: *See*—
Ohashi, Masato; Kashioka, Motohiko; Tamura, Shinichi; Katsura, Hiromitsu; Ueda, Hideaki; and Nakamura, Akihiro, 4,618,554, Cl. 430-78.000.

Katz, Leonard A.: *See*—
Ish-Shalom, Jehuda; Katz, Leonard A.; and Manzer, Dennis G., 4,618,808, Cl. 318-696.000.

Kaufman, Yaacov. Ergonomic chair. 4,618,185, Cl. 297-285.000.

Kaus, Malcolm J.; and Miro, Nemesio D., to Phillips Petroleum Company. Supported high efficiency polyolefin catalyst component and methods of making and using the same. 4,618,661, Cl. 526-114.000.

Kawabata, Shunichiro: *See*—
Makino, Shigeru; Katagi, Takashi; Urasaki, Shuji; Kawabata, Shunichiro; and Kobayashi, Yuji, 4,618,866, Cl. 343-779.000.

Kawaguchi, Frank M., to Northrop Corporation. Dynamic shading compensation for IR tracking system. 4,618,892, Cl. 358-163.000.

Kawaguchi, Katsuhiko; and Ono, Yoshiaki, to Tokyo Electric Co., Ltd. Automatic paper sheet supplying apparatus. 4,618,134, Cl. 271-4.000.

Kawai, Kenji: *See*—
Miyasaka, Eiji; Hirose, Iwao; Yamashita, Koji; Kawai, Kenji; and Kanada, Eiji, 4,618,255, Cl. 355-71.000.

Kawai, Makoto: *See*—
Egami, Shunichiro; and Kawai, Makoto, 4,618,831, Cl. 330-124.00R.

Kawai, Toshitake: *See*—
Toshimitsu, Yoshihiko; Takaoka, Tokuro; Kawai, Toshitake; and Ishida, Takashi, 4,618,018, Cl. 180-142.000.

Kawajiri, Junichi, to Bridgestone Corporation. Tire for use in running on soft ground and excellent in ground-contacting property. 4,617,976, Cl. 152-209.00R.

Kawakami, Chikuni, to Fuji Photo Film Co., Ltd. Direct current power control on selectable voltage step-up and step-down. 4,618,812, Cl. 323-224.000.

Kawakami, Sanji: *See*—
Chikatani, Hajime; and Kawakami, Sanji, 4,617,785, Cl. 53-562.000.

Kawakami, Shigenobu: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,618,914, Cl. 361-315.000.

Kawakubo, Fumio; Takanoo, Miyako; Yukimoto, Sadao; and Isayama, Katsuhiko, to Kanegafuchi Chemical Industry Co., Ltd. Novel polymer and cured product of the same. 4,618,653, Cl. 525-404.000.

Kawakubo, Fumio; Takanoo, Miyako; Yukimoto, Sadao; and Isayama, Katsuhiko, to Kanegafuchi Chemical Industry Co., Ltd. Novel polymer and cured product of the same. 4,618,656, Cl. 525-404.000.

Kawamura, Katsuaki, to Pioneer Electronic Corporation. Radio communications control system which automatically returns the system to the speech channel. 4,618,998, Cl. 455-77.000.

Kawamura, Kazue: *See*—
Shiio, Isamu; Sugimoto, Shinichi; and Kawamura, Kazue, 4,618,580, Cl. 435-108.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Hanada, Sadashi; and Nakabayashi, Akira, 4,618,089, Cl. 228-212.000.

Kawashima, Saburo: *See*—
Yamaguchi, Keizaburo; Sugimoto, Kenichi; Tanabe, Yoshimitsu; Kawashima, Saburo; and Yamaguchi, Akihiro, 4,618,714, Cl. 564-329.000.

Kay, Brian D.: *See*—
Campisi, Carl; and Kay, Brian D., 4,618,131, Cl. 269-32.000.

Kay, Edward L.; and Roskos, Kenneth B., to Firestone Tire & Rubber Company, The. Nucleation of urethane compositions. 4,618,667, Cl. 528-49.000.

Kayane, Yutaka; Miyamoto, Tetsuya; Omura, Takashi; Sawamoto, Hirokazu; Harada, Naoki; and Takeshita, Akira, to Sumitomo Chemical Company, Limited. 4-methyl-pyridone monoazo compound having both monochlorotriazinyl and vinylsulfone type fiber-reactive groups. 4,618,671, Cl. 534-635.000.

Kayes, Allan G., to Pneumatic Punchers Limited. Impact-action self-propelled mechanism for driving holes in the earth. 4,618,007, Cl. 175-19.000.

Kazuhiko, Ueda: *See*—
Sasaki, Junzo; Hitomi, Mitsuo; and Kazuhiko, Ueda, 4,617,897, Cl. 123-432.000.

Kazuse, Yoshitaka: *See*—
Iwama, Akio; Tasaka, Kentaro; and Kazuse, Yoshitaka, 4,618,534, Cl. 428-316.600.

Keane, James W., to Whirlpool Corporation. Vacuum cleaner hose coupling. 4,618,195, Cl. 339-16.00R.

Keay, Robert E.: *See*—
Hobson, Philip B.; and Keay, Robert E., 4,618,728, Cl. 568-652.000.

Kedzierski, Heinrich, to WABCO Westinghouse Steuerungstechnik GmbH. Sealing arrangement for a longitudinally-slotted pressure cylinder closed on the ends. 4,617,857, Cl. 92-88.000.

Keigler, John E., to RCA Corporation. Spacecraft angular momentum stabilization system and method. 4,618,112, Cl. 244-158.00R.

Keiichi, Yamada: *See*—
Suzuki, Shoichi; and Keiichi, Yamada, 4,617,793, Cl. 60-285.000.

Keith, Charles H., to Brown & Williamson Tobacco Corporation. Tobacco smoke mouthpiece and method of making same. 4,617,946, Cl. 131-336.000.

Kelemen, Jozsef: *See*—
Budai, Zoltan; Benko, Pal; Ratz nee Simonek, Ildiko ; Rakoczy nee Pinter, Eva; Magyar, Karoly; Kelemen, Jozsef; and Mandi, Attila, 4,618,623, Cl. 514-478.000.

Keller, Vernon W.; Owen, Robert B.; Elkins, Bobby R.; and White, William T., to United States of America, National Aeronautics and Space Administration. Double window viewing chamber assembly. 4,618,215, Cl. 350-319.000.

Kelley, James O., to Herman Miller, Inc. Cabinet with hanger rails. 4,618,192, Cl. 312-245.000.

Kelley, Stephen H.; and Rybicki, Mathew A., to Motorola, Inc. Monotonic A/D converter which minimizes circuitry for high order bit conversion. 4,618,852, Cl. 340-347.0AD.

Kelly, Pilar P.: *See*—
Fair, David L.; Justice, David D.; and Kelly, Pilar P., 4,618,403, Cl. 204-98.000.

Kelmetis, George C. Bird cage with fold-down top. 4,617,873, Cl. 119-17.000.

Kemp, Saundra R. Automatic system and method for monitoring and storing radio user listening habits. 4,618,995, Cl. 455-2.000.

Kendall-Tobias, Michael W. Fluid flow control system. 4,617,953, Cl. 137-110.000.

Kennedy, Earl E.: *See*—
Knobel, Thomas M.; Kennedy, Earl E.; and Walker, Mary A., 4,618,630, Cl. 521-105.000.

Kenyon, Jack. Plate and diaphragm assembly for a filter press. 4,617,863, Cl. 100-194.000.

Kerkman, Daniel J.: *See*—
DeBernardis, John F.; Kerkman, Daniel J.; and McClellan, William J., 4,618,683, Cl. 548-420.000.

Kesselring, Kurt: *See*—
Stapel, Gunter; Gober, Karl-Heinz; Leyck, Sigurd; Wetzig, Helmut; Birkner, Christian; Kesselring, Kurt; Christ, Bruno; Steiner, Klaus; and Schroder, Friedhelm, 4,618,605, Cl. 514-177.000.

KEUCO Paul Keune GmbH & Co. KG: *See*—
Gerbe, Helmut, 4,618,117, Cl. 248-222.100.

Kikuchi, Katsuya: *See*—
Honda, Michitaka; and Kikuchi, Katsuya, 4,618,928, Cl. 364-414.000.

Kikuchi, Toshiyuki: *See*—
Sotoyama, Kaoru; Sumida, Shizuo; and Kikuchi, Toshiyuki, 4,618,041, Cl. 192-0.044.

Kikyohara, Tadashi: *See*—
Yamanouchi, Katsuto; Saitoh, Katsuo; Saito, Yoshinori; and Kikyohara, Tadashi, 4,618,417, Cl. 210-149.000.

Kim, Bang M., to General Electric Company. Process for recovery of zinc from plating waste solutions. 4,618,428, Cl. 210-648.000.

Kim, Oh-Kil, to United States of America, Navy. Conductive heterocyclic ladder polymers. 4,618,453, Cl. 252-500.000.

Kimoto, Takami: *See*—
Tokuda, Makoto; and Kimoto, Takami, 4,618,181, Cl. 296-191.000.

Kimura, Ryoichi; Nomura, Kanji; Ubukata, Kazumi; and Kasahara, Shinju, to Honda Giken Kogyo Kabushiki Kaisha. Rear window light screen particularly for an automobile. 4,618,132, Cl. 296-97.00J.

Kimura, Tokuji; and Urushihara, Toshio, to Kabushiki Kaisha Toshiba. Sheet separating apparatus. 4,618,085, Cl. 225-100.000.

Kimura, Yutaka, to Kabushiki Kaisha Universal. Game machine with selective stop means for moving display. 4,618,150, Cl. 273-143.00R.

King Instrument Corporation: *See*—
Woodley, George M., 4,617,719, Cl. 29-564.600.

King, James P.: *See*—
Toukan, Sameeh S.; and King, James P., 4,618,438, Cl. 252-47.500.

Kinkelaar, Edmund W.; and Pekar, Howard G., to Texo Corporation. Tin plating immersion process. 4,618,513, Cl. 427-443.100.

Kinnan, Frank, to Electric Power Research Institute. Techniques for establishing inground support footings and for strengthening and stabilizing the soil at inground locations. 4,618,287, Cl. 405-232.000.

Kinz, Peter, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch with pivotable diaphragm spring on the clutch cover. 4,618,047, Cl. 192-89.00B.

Kishi, Hiroyoshi: *See*—
Takano, Katsuhiko; Iijima, Shigeharu; Yoshihara, Satoshi; Matsushima, Masaaki; Kishi, Hiroyoshi; and Sasamori, Eizo, 4,618,537, Cl. 428-336.000.

Kishida, Eiji; and Hasegawa, Shumpei, to Honda Giken Kogyo Kabushiki Kaisha. Secondary air supply for internal combustion engine. 4,617,891, Cl. 123-344.000.

Kishida, Eiji: *See*—
Kobayashi, Hideo; and Kishida, Eiji, 4,617,900, Cl. 123-489.000.

Kishie, Hidehiko: *See*—
Yamamoto, Hideomi; Watanabe, Haruzo; Kishie, Hidehiko; and Nishihara, Toshio, 4,617,717, Cl. 29-527.400.

Kishimoto, Shinichi: *See*—
Ozawa, Yoichi; Kishimoto, Shinichi; Shinohara, Emiko; Takemoto, Tadashi; and Eguchi, Chikahiko, 4,618,695, Cl. 560-41.000.

Kitada, Akira, to Fuji Photo Film Co., Ltd. Radiographic intensifying screen. 4,618,778, Cl. 250-483.100.

Kitagawa, Masahiro, to Olympus Optical Co., Ltd. Motor drive for camera. 4,618,237, Cl. 354-412.000.

Kitai, Toshio, to Kabushiki Kaisha Kitai Tekkosho. Steering structure for ship propelling device. 4,618,327, Cl. 440-53.000.

Kitamura, Shigeto: *See*—
Hashizume, Kazuko; Kase, Hiroshi; Kitamura, Shigeto; Iida, Takao; Shirahata, Kunikatsu; Omori, Kenji; and Shuto, Katsuichi, 4,618,613, Cl. 514-312.000.

Kitani, Masakatu: *See*—
Saito, Toranosuke; Kitani, Masakatu; and Ohishi, Hiroyuki, 4,618,693, Cl. 558-82.000.

Kiuchi, Takeo: *See*—
Otobe, Yutaka; and Kiuchi, Takeo, 4,618,954, Cl. 371-16.000.

Kiyomiya, Yutaka: *See*—
Sasaki, Yutaka; Kiyomiya, Yutaka; and Nakamura, Toshio, 4,618,593, Cl. 502-20.000.

KLA Instruments Corporation: *See*—
Sandland, Paul; Chadwick, Curt H.; Singleton, Russell M.; and Dwyer, Howard, 4,618,938, Cl. 364-552.000.

Klebovich, Imre: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,618,611, Cl. 514-255.000.

Kleemann, Axel: *See*—
Drauz, Karlheinz; and Kleemann, Axel, 4,618,730, Cl. 568-771.000.

Klein, Gerald B. Conical can end with push down gate. 4,618,301, Cl. 413-8.000.

Klein, Horst: *See*—
Amos, Walter; and Klein, Horst, 4,617,695, Cl. 15-195.000.

Klimesch, Roger G.: *See*—
Lichtenthaler, Frieder W.; and Klimesch, Roger G., 4,618,675, Cl. 536-17.200.

Knaack Mfg. Co.: *See*—
Weger, Kenneth F., Jr., 4,618,083, Cl. 224-324.000.

Knapp, Janet S.; and Hillman, Jerry L., to Rockwell International Corporation. Sleeve valve for a pulsed gas generator. 4,617,796, Cl. 60-39.790.

Knapp, John F., to Xerox Corporation. Apparatus for color development with a magnetic separator containing a stationary shell with rotating magnets. 4,618,243, Cl. 355-4.000.

Knell, Bernhard: *See*—
Tinnes, Bernhard; Knell, Bernhard; and Vetterli, Walter, 4,618,126, Cl. 266-271.000.

Knifton, John F.: *See*—
Renken, Terry L.; and Knifton, John F., 4,618,717, Cl. 564-475.000.

Knobel, Thomas M.; Kennedy, Earl E.; and Walker, Mary A., to Dow Chemical Co., The. Organic polymer composition containing an antistatic agent comprising a nonvolatile ionizable metal salt and a salt or ester of a carboxylic acid. 4,618,630, Cl. 521-105.000.

Kobayashi, Fumio: *See*—
Kagiyama, Tsutomu; Kobayashi, Fumio; Yamagishi, Jun; and Nishikawa, Hiromitsu, 4,617,757, Cl. 49-280.000.

Kobayashi, Hideo; and Kishida, Eiji, to Honda Giken Kogyo Kabushiki Kaisha. Air-fuel ratio control system for an internal combustion engine having a control characteristic varying with the engine load. 4,617,900, Cl. 123-489.000.

Kobayashi, Hidetoshi: *See*—
Mihayashi, Keiji; Kobayashi, Hidetoshi; and Takada, Shunji, 4,618,572, Cl. 430-543.000.
Okamura, Hisashi; Kobayashi, Hidetoshi; Nishikawa, Toshihiro; and Tamoto, Koji, 4,618,573, Cl. 430-558.000.
Kobayashi, Kiyonori, to Aisin Seiki Kabushiki Kaisha. Clutch disk assembly. 4,618,048, Cl. 192-106.200.
Kobayashi, Kunio: *See*—
Mashino, Keiichi; Satou, Morio; Masumoto, Shouji; Kobayashi, Kunio; and Miki, Osamu, 4,618,811, Cl. 322-28.000.
Kobayashi, Masaaki, to Shinko Denshi Company Limited. Weight measuring apparatus of vibration type. 4,618,014, Cl. 177-210.0FP.
Kobayashi, Nobuyuki; and Ito, Toshimitsu, to Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling idling speed in internal combustion engine having two bypass air passages. 4,617,890, Cl. 123-339.000.
Kobayashi, Shinma; and Kajita, Shunsuke, to Nissan Shatai Company, Limited. Air conditioning arrangement for automotive vehicle or the like. 4,617,986, Cl. 165-42.000.
Kobayashi, Yuji: *See*—
Makino, Shigeru; Katagi, Takashi; Urasaki, Shuji; Kawabata, Shunichiro; and Kobayashi, Yuji, 4,618,866, Cl. 343-779.000.
Koboshi, Shigeharu: *See*—
Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,618,569, Cl. 430-428.000.
Kocev, Angel: *See*—
Palfery, Kenneth J.; Puckering, Donald R.; Kocev, Angel; and Maharaj, Kenrick B., 4,617,720, Cl. 29-568.000.
Koch, Paolo: *See*—
Brandi, Gabriella; Koch, Paolo; Maiorana, Stefano; Dalla Croce, Piero; and Baldoli, Clara, 4,618,439, Cl. 252-47.500.
Koch, Russell W.; and Snyder, Douglas D., to Firestone Tire & Rubber Company, The. Tire repair by "patch only" method. 4,618,519, Cl. 428-63.000.
Kochannek, Franz, to Robert Bosch GmbH. Vane-type compressor having resilient slot seals. 4,618,319, Cl. 418-136.000.
Kodama, Yoshihiro: *See*—
Tsuchida, Seiichi; Kodama, Yoshihiro; and Hara, Hiroari, 4,618,640, Cl. 524-272.000.
Kodera, Masao: *See*—
Sakakibara, Hiroyuki; Akita, Shigeyuki; Kodera, Masao; and Maeno, Tsuyoshi, 4,618,948, Cl. 367-104.000.
Koepke, Jeffery W.: *See*—
Young, Dean A.; and Koepke, Jeffery W., 4,618,738, Cl. 585-480.000.
Kohl, Ernst: *See*—
Bilharz, Manfred; Heider, Peter; Roper, Hartmut; Taal, Martin; Henken, Fritz; Kohl, Ernst; and Schubert, Dietmar, 4,618,123, Cl. 251-28.000.
Kohl, William A.: *See*—
Ray, Edgar C.; and Kohl, William A., 4,618,740, Cl. 174-67.000.
Kohler, Boris: *See*—
Ackermann, Peter; Gsell, Laurenz; and Kohler, Boris, 4,618,615, Cl. 514-338.000.
Kohnen, Klaus; Niermann, Hans; and Ullrich, Norbert, to Krupp-Koppers GmbH. Soot blower for the removal of deposits from surfaces of heat exchangers or the like. 4,617,988, Cl. 165-95.000.
Koistinen, Pauli A. T.; and Hamalainen, Risto J., to OY Tampella AB. Method for preliminary anchoring of a wire rope bolt. 4,617,715, Cl. 29-456.000.
Kojima, Tetsuji: *See*—
Noguchi, Matsusaburo; Yamamoto, Mikio; and Kojima, Tetsuji, 4,618,250, Cl. 355-15.000.
Kokubo, Eiichi; and Hirata, Akira, to Laurel Bank Machine Co., Ltd. Device for accumulating and delivering paper sheets. 4,618,302, Cl. 414-33.000.
Koleske, Joseph V.: *See*—
Osborn, Claiborn L.; Koleske, Joseph V.; and Drake, Kenneth, 4,618,635, Cl. 524-113.000.
Kolodziej, Raymond J.: *See*—
Miller, William H.; McClendon, Samuel E.; Kolodziej, Raymond J.; and Brand, Donald L., 4,618,931, Cl. 364-431.020.
Koltenback, Steven R.: *See*—
Beck, William R.; Jahn, William; Koltenback, Steven R.; Scharf, Robert M.; and Schwab, Ronald, 4,617,732, Cl. 29-866.000.
Komamura Photographic Co., Ltd.: *See*—
Tomidokoro, Kanji, 4,618,062, Cl. 206-455.000.
Komet Stahlhalter- und Werkzeugfabrik Robert Bruning, GmbH: *See*—
Eckle, Otto; and Veigel, Helmut, 4,617,848, Cl. 82-36.00A.
Kondo, Michikazu, to NEC Corporation. Optical switch of switched directional coupler type. 4,618,210, Cl. 350-96.140.
Kondo, Shyunichi: *See*—
Yuyama, Yasuaki; Nakano, Junji; Kondo, Shyunichi; Sato, Hideo; and Sawada, Kenichi, 4,618,553, Cl. 430-69.000.
Kondo, Toshikatsu: *See*—
Asano, Kiyomitsu; and Kondo, Toshikatsu, 4,618,277, Cl. 400-124.000.
Kondo, Yasuo; Watanabe, Masakane; and Oshiro, Takao, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Window washer for vehicle. 4,618,096, Cl. 239-101.000.
Kondoh, Norimasa: *See*—
Kakuda, Yoshitaka; and Kondoh, Norimasa, 4,618,790, Cl. 310-90.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Kadowaki, Takashi; and Onodera, Kaoru, 4,618,570, Cl. 430-505.000.
Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,618,569, Cl. 430-428.000.
Kopacz, Bernard F., to Becton, Dickinson and Company. Surgical blade handle. 4,617,738, Cl. 30-339.000.
Kordik, Gabriella: *See*—
Trinn, Maria; Kordik, Gabriella; Udvardy-Nagy nee Cserey Pechaany, Eva; Vida, Zsuzsanna; and Zsoka nee Somkuti, Rzsebet, 4,618,581, Cl. 435-119.000.
Kori, Takuaki; Ozawa, Hirotaka; and Sugawara, Shiro, to Sony Corporation. Process and apparatus for finishing a guide roller. 4,617,714, Cl. 29-434.000.
Kornberg, Elliot. Device and method for performing an intraluminal abdominal aortic aneurysm repair. 4,617,932, Cl. 128-334.00R.
Kotani, Matahira; and Matsumoto, Masafumi, to Sharp Kabushiki Kaisha. Facsimile print out system employing an ink jet system printer. 4,618,869, Cl. 346-75.000.
Kotera, Yoshikazu, to Mitsubishi Denki Kabushiki Kaisha. Process for controlling load distribution in continuous rolling mill. 4,617,814, Cl. 72-8.000.
Kotliar, Abraham M.: *See*—
Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; Oltmann, Harold D.; and Chen, Shu P., 4,618,528, Cl. 428-216.000.
Kotnik, Ernest J., to AP Industries, Inc. Insulator removal tool. 4,617,710, Cl. 29-268.000.
Kotobuki & Co., Ltd.: *See*—
Kageyama, Hidehei, 4,618,280, Cl. 401-107.000.
Kouyama, Toshitake; and Katsube, Ryoji, to NEC Corporation. Digital audio synchronizing system with mute time switching function. 4,618,890, Cl. 358-149.000.
Koyama, Katsuhide, to Kabushiki Kaisha Toshiba. X-ray fluoroscopic/radiographic apparatus. 4,618,979, Cl. 378-176.000.
Kozyra, William L.; MacIsaac, Andrew B.; and Santoro, Vincent J., to Budd Company, The. Steering knuckle assembly. 4,618,159, Cl. 280-93.000.
Kraiss, Richard, to Georg Prinzing GmbH & Co. KG Betonformen-und Maschinenfabrik. Core segment for concrete forming apparatus. 4,618,122, Cl. 249-94.000.
Kramer, Ted J.: *See*—
Shaw, Christopher G.; and Kramer, Ted J., 4,618,218, Cl. 350-363.000.
Kraus, Charles E., to Excelermatic Inc. Hydrostatic bearing structure. 4,618,270, Cl. 384-114.000.
Krauss u. Reichert GmbH & Co. KG: *See*—
Jung, Rolf, 4,617,737, Cl. 30-273.000.
Kreiskott, Horst: *See*—
Schlecker, Rainer; Schmidt, Peter; Thieme, Peter C.; Lenke, Dieter; Teschendorf, Hans-Jurgen; Traut, Martin; Mueller, Claus D.; Hofmann, Hans P.; and Kreiskott, Horst, 4,618,622, Cl. 514-457.000.
Kremer, Paul W.: *See*—
DePasquale, Ralph J.; Evans, James M.; and Kremer, Paul W., 4,618,688, Cl. 556-419.000.
Kress Corporation: *See*—
Kress, Edward S.; LaBerdia, William L.; and Thomas, Dennis R., 4,618,307, Cl. 414-498.000.
Kress, Edward S.; LaBerdia, William L.; and Thomas, Dennis R., to Kress Corporation. Scrap bucket carrier. 4,618,307, Cl. 414-498.000.
Kriskovich, Robert T.: *See*—
Christopher, Walter S.; Kriskovich, Robert T.; and Steinbach, Robert L., 4,617,813, Cl. 70-394.000.
Kristof, Mark J.: *See*—
Schwaderer, John R.; and Kristof, Mark J., 4,618,756, Cl. 219-10.55R.
Kriz, Karel: *See*—
Katchko, John; Plaisance, Thomas H.; and Kriz, Karel, 4,618,657, Cl. 525-443.000.
Kroger Co., The: *See*—
Woolf, Robert M., 4,618,032, Cl. 186-61.000.
Kroger, Doris: *See*—
Butenop, Klaus; and Kroger, Doris, 4,618,108, Cl. 242-107.000.
Kropp, Walter, to Linde Aktiengesellschaft. Multiple consumer hydraulic mechanisms. 4,617,854, Cl. 91-517.000.
Kropp, Walter: *See*—
Krusche, Alfred; and Kropp, Walter, 4,617,798, Cl. 60-450.000.
Krupp-Koppers GmbH: *See*—
Kohnen, Klaus; Niermann, Hans; and Ullrich, Norbert, 4,617,988, Cl. 165-95.000.
Krusche, Alfred; and Kropp, Walter, to Linde Aktiengesellschaft. Hydrostatic drive systems. 4,617,798, Cl. 60-450.000.
Kubisiak, Michael P.: *See*—
Berman, Jody R.; Steele, Dennis L.; and Kubisiak, Michael P., 4,618,526, Cl. 428-209.000.
Kubo, Akio. Lead device for drawing machine. 4,617,739, Cl. 33-18.100.
Kubo, Emiko: *See*—
Sato, Takashi; and Kubo, Emiko, 4,618,588, Cl. 436-511.000.
Kubo, Kanji; Wada, Kenichi; and Shintani, Yooichi, to Hitachi, Ltd. Buffer storage control system. 4,618,926, Cl. 364-200.000.
Kubota, Ltd.: *See*—
Eguchi, Jutaro; Odahara, Tetsuichi; and Sukenari, Junzo, 4,617,787, Cl. 56-14.600.
Kubota, Yuichi: *See*—
Nishimatsu, Masaharu; Ide, Toshiaki; Arioka, Hiroyuki; and Kubota, Yuichi, 4,618,535, Cl. 428-325.000.

Kuch, Philip L.: *See—*
Herrington, Daniel R.; and Kuch, Philip L., 4,618,723, Cl. 568-70.000.

Kuck, Mark A.; and Gersten, Susan W., to Stauffer Chemical Company. Method of preparing high purity white phosphorus. 4,618,345, Cl. 23-293.00R.

Kuhn, Friedrich, to J. M. Voith GmbH. Roller winding machine attaching and serving apparatus. 4,618,105, Cl. 242-56.0OR.

Kumamoto, Kenichiro: *See—*
Kajiwara, Tadashi; Sato, Akira; Tsurumaru, Shinobu; and Kumamoto, Kenichiro, 4,618,838, Cl. 333-33.000.

Kume, Masao: *See—*
Miyatake, Satoshi; Abe, Mitsuo; and Kume, Masao, 4,617,761, Cl. 51-95.0GH.

Kuo, Dai-Ming. Toilet having adjustable water-spray nozzles. 4,617,688, Cl. 4-420.200.

Kuramoto, Nobuyuki; and Taniguchi, Hitofumi, to Tokuyama Soda Kabushiki Kaisha. Fine powder of aluminum nitride, composition and sintered body thereof and processes for their production. 4,618,592, Cl. 501-96.000.

Kuramoto, Shinichi; and Takanashi, Hajime, to Ricoh Co., Ltd. Liquid developer for use in electrostatic photography. 4,618,558, Cl. 430-115.000.

Kurematsu, Masayuki; and Koboshi, Shigeharu, to Konishiroku Photo Industry Co., Ltd. Method for processing of silver halide color photographic material. 4,618,569, Cl. 430-428.000.

Kurik, Choei: *See—*
Yamada, Hisafumi; Kurik, Choei; and Saito, Junya, 4,618,891, Cl. 358-153.000.

Kuriyama, Toshihiro, to Alps Electric Co., Ltd. Magnetic head with clamping erase back core. 4,618,902, Cl. 360-118.000.

Kuroda, Kouki: *See—*
Nagashima, Nao; Suzuki, Koji; Nagahira, Jyoji; Kuroda, Kouki; and Takayanagi, Yoshiaki, 4,618,246, Cl. 355-14.00R.

Kuroda, Masato: *See—*
Fujiwara, Masatoshi; and Kuroda, Masato, 4,617,952, Cl. 137-85.000.

Kuroo, Yoshiyasu: *See—*
Okamura, Kiyohito; Hasegawa, Yoshio; Kuroo, Yoshiyasu; and Ugaji, Masana, 4,618,591, Cl. 501-90.000.

Kurtzman, Myron B.: *See—*
Agapiou, Agapios K.; Muhle, Michael E.; and Kurtzman, Myron B., 4,618,596, Cl. 502-116.000.

Kutsukake, Yukinori: *See—*
Ohe, Junya; Wakita, Saburo; Yamatsuta, Kiichi; Goto, Shoji; Kutsukake, Yukinori; and Sugizaki, Masuo, 4,618,474, Cl. 420-436.000.

Kwilos, Jerald J., to AT&T Bell Laboratories. Connecting block for digital system cross-connect frame. 4,618,194, Cl. 339-14.00R.

Kyowa Hakko Kogyo Company, Ltd.: *See—*
Hashizume, Kazuko; Kase, Hiroshi; Kitamura, Shigeto; Iida, Takao; Shirahata, Kunikatsu; Omori, Kenji; and Shuto, Katsuichi, 4,618,613, Cl. 514-312.000.
Hirata, Tadashi; Saito, Hiromitsu; and Morimoto, Makoto, 4,618,687, Cl. 549-396.000.

Kyung, Jai H.: *See—*
Grimm, Robert A.; Kyung, Jai H.; Brusky, Phyllis L.; Holehouse, Joseph G.; and Chang, Biau-hung, 4,618,707, Cl. 560-337.000.

Kyushu Hitachi Maxell, Ltd.: *See—*
Nagao, Tadasu; and Sayama, Shigeharu, 4,618,099, Cl. 239-332.000.

Lab Stuff, Inc.: *See—*
Malavarca, Richard; and Livelli, Thomas, 4,618,408, Cl. 204-299.00R.

LaBerdia, William L.: *See—*
Kress, Edward S.; LaBerdia, William L.; and Thomas, Dennis R., 4,618,307, Cl. 414-498.000.

Laboratorios Vinas, S.A.: *See—*
Vinas, Antonio B., 4,618,625, Cl. 514-494.000.

Lagasse, Charles A., to PlasTek Corporation. Reaction injection molding system with finger gate. 4,618,322, Cl. 425-129.00R.

La Grotteria, Julius K. Bag convertable to place mat. 4,618,992, Cl. 383-4.000.

Lai, Wen T. High impact force stapling machine with rebounded impact force damping. 4,618,087, Cl. 227-131.000.

Laitinen, Lauri V. Adapter for definition of the position of brain structures. 4,617,925, Cl. 128-303.00B.

Lamb-Weston, Inc.: *See—*
Santillie, Paul W.; and Ramras, Daniel M., 4,618,479, Cl. 422-202.000.

Lambert, John M.: *See—*
Blattler, Walter A.; Lambert, John M.; and Senter, Peter D., 4,618,492, Cl. 424-85.000.

Lamensdorf, David; and Daigle, Chris J., to Sperry Corporation. Dielectric trough waveguide antenna. 4,618,865, Cl. 343-776.000.

Lang, Albrecht; and Sakmann, Walter H., to International Business Machines Corporation. Transistor power amplifier having reduced switching times. 4,618,782, Cl. 307-255.000.

Langenkamp, Ulrich: *See—*
Backes, Reiner; and Langenkamp, Ulrich, 4,618,788, Cl. 307-603.000.

Langner, Carl G., to Shell Oil Company. Drilling riser braking apparatus and method. 4,617,998, Cl. 166-345.000.

Lanza, Gregory M.: *See—*
DeGeeter, Melvin J.; Lanza, Gregory M.; and Vineyard, Billy D., 4,618,604, Cl. 514-130.000.

Laragh, John H.: *See—*
Johnson, Lorin K.; Atlas, Steven A.; and Laragh, John H., 4,618,600, Cl. 514-12.000.

Lark, Kristine A.: *See—*
Gegel, Harold L.; Malas, James C.; Prasad, Yellapregada V. R. K.; Doraivelu, Sokka M.; Barker, Douglas R.; Morgan, James T., Jr.; and Lark, Kristine A., 4,617,817, Cl. 72-364.000.

Larsson, Hans G.; Westman, Erik; and Ostlund, Artur, to Asea AB. Ladle or tundish. 4,618,964, Cl. 373-155.000.

Laser Science, Inc.: *See—*
Nazemi, Said, 4,618,960, Cl. 372-58.000.

Lasiter, David N.: *See—*
Wilson, Joseph H.; Lasiter, David N.; and McKee, Randall G., 4,618,103, Cl. 241-41.000.

Lasky, Harold J. Mammographic X-ray apparatus. 4,618,973, Cl. 378-037.000.

Lau, Hon Chung, to Shell Oil Company. Dual gradient steam foam oil displacement process. 4,617,995, Cl. 166-272.000.

Laumen, Kurt: *See—*
Schneider, Manfred; and Laumen, Kurt, 4,618,690, Cl. 556-441.000.

Laurel Bank Machine Co., Ltd.: *See—*
Kokubo, Eiichi; and Hirata, Akira, 4,618,302, Cl. 414-33.000.
Yoshikawa, Eiichi, 4,618,072, Cl. 221-2.000.

Laurent, Robert M.: *See—*
Prillieux, Marcel; Laurent, Robert M.; and Tirtiaux, Robert, 4,618,458, Cl. 260-505.00P.

Law, Kirk A.: *See—*
Harwood, Leopold A.; Chin, Danny; and Law, Kirk A., 4,618,882, Cl. 358-31.000.

Lawson, H. Franklin: *See—*
Dehm, David C.; and Lawson, H. Franklin, 4,618,655, Cl. 525-344.000.

Lay, Khin M.; Palguta, Stephen E.; Fernandez, Ramon B.; and Cabalquinto, Santiago C., to Hitco. Method of joining edges of two elongated webs. 4,617,716, Cl. 29-526.00R.

Lazes, Richard J. Hydro pressure thread tester. 4,617,823, Cl. 73-46.000.

Lecomte, Jeanne-Marie: *See—*
Roques, Bernard; Schwartz, Jean-Charles; and Lecomte, Jeanne-Marie, 4,618,708, Cl. 562-448.000.

Lee, Kenneth R.: *See—*
Cedrone, Nicholas J.; and Lee, Kenneth R., 4,618,305, Cl. 414-403.000.

Lee, Len F., to Monsanto Company. 3,5-dicarboxylic acid esters of 2,6-bis(fluoro-alkyl)-2,6-bis(hydroxy) piperidines. 4,618,679, Cl. 546-220.000.

Lee, Peter; Cheung, George F.; and Yee, Joe T., to American Phone Products. Integral phone light accessory. 4,618,917, Cl. 362-88.000.

Legierse, Petrus E. J.: *See—*
Temple, James S.; Legierse, Petrus E. J.; and Martens, Theodorus H. G., 4,618,506, Cl. 427-40.000.

Lehmann, Ernesto: *See—*
Thalmann, Alfred; and Lehmann, Ernesto, 4,618,168, Cl. 285-21.000.

Leigh-Monstevens, Keith V.: *See—*
Wrobleski, David L.; Mienko, David K.; and Leigh-Monstevens, Keith V., 4,617,855, Cl. 92-5.00R.

Leithauser, Horst: *See—*
Rigler, Josef K.; and Leithauser, Horst, 4,618,468, Cl. 264-53.000.

Lempert, Dennis A.: *See—*
Hagan, Richard J.; and Lempert, Dennis A., 4,617,973, Cl. 141-2.000.

Lendvai, Tibor: *See—*
Batorfalvi, Geza; Lendvai, Tibor; Radai, Antal; Pongrac, Gaborne ; Szabo, Miklos; and Szilardi, Jeno , 4,617,700, Cl. 17-45.000.

Lenhoff, John G., Jr., to Westinghouse Electric Corp. A/D converter having digitally controlled subranging and self alignment apparatus for use therein. 4,618,850, Cl. 340-347.0CC.

Lenke, Dieter: *See—*
Schlecker, Rainer; Schmidt, Peter; Thieme, Peter C.; Lenke, Dieter; Teschendorf, Hans-Jurgen; Traut, Martin; Mueller, Claus D.; Hofmann, Hans P.; and Kreiskott, Horst, 4,618,622, Cl. 514-457.000.

Lenz, Hans-Heinrich, to BASF Aktiengesellschaft. Preparation of α-methyl-substituted ketones. 4,618,725, Cl. 568-315.000.

Lenz, Seymour S. Test probe assembly for microelectronic circuits. 4,618,821, Cl. 324-158.00P.

Leopold, Howard S., to Eagle Electric Mfg. Co., Inc. Desensitized ground fault interrupter. 4,618,907, Cl. 361-45.000.

Le Salver, Robert; and Poupard, Dominique, to Automobiles Peugeot; and Automobiles Citroen. Connecting device between the structure of a vehicle and a suspension strut. 4,618,127, Cl. 267-8.00R.

Lescrenier, Charles; and Bautista, Val, to Lescrenier, Charles. Exit beam indicator for radiographic equipment. 4,618,980, Cl. 378-206.000.

LeVahn, Bruce A.; and Olson, Robert E., to Minnesota Scientific, Inc. Retractor apparatus. 4,617,916, Cl. 128-20.000.

Lever Brothers Company: *See—*
Madan, Gulzari L.; and Rao, Bookinkere C. S., 4,618,445, Cl. 252-99.000.

Levesque, Guy; and Tozzolino, Pierre, to Societe Nationale Elf Aquitaine (Production). Thioamides, their preparation and uses. 4,618,416, Cl. 209-166.000.

Levine, Aaron W.: *See—*
White, Lawrence K.; Miszkowski, Nancy A.; and Levine, Aaron W., 4,618,565, Cl. 430-271.000.

Leyck, Sigurd: *See*—
Dereu, Norbert; Welter, Andre ; Wendel, Albrecht; Leyck, Sigurd; Parnham, Michael; Graf, Erich; Sies, Helmut; Betzing, Hans; and Fischer, Hartmut, 4,618,669, Cl. 530-331.000.
Stapel, Gunter; Gober, Karl-Heinz; Leyck, Sigurd; Wetzig, Helmut; Birkner, Christian; Kesselring, Kurt; Christ, Bruno; Steiner, Klaus; and Schroder, Friedhelm, 4,618,605, Cl. 514-177.000.

Li, Lehmann K.; and Marra, Michael, to American Cyanamid Company. Skin stapler. 4,618,086, Cl. 227-19.000.

Li, Paul Z., to Florida State University. Serial bearing assembly. 4,618,271, Cl. 384-461.000.

Li, Yao T. Wobble tube evaporator with whip rod fluid distributor. 4,618,399, Cl. 159-6.200.

Liberkowski, Janusz. Roller skates for figure skating. 4,618,158, Cl. 280-11.1BR.

Libregts, Hubertus B.; and van Nes, Cornelis G. J., to Du Pont de Nemours, E. I., and Company. Connector with strain relief. 4,618,202, Cl. 339-99.00R.

Licentia Patent-Verwaltungs-GmbH: *See*—
Gemmler, Armin, 4,618,568, Cl. 430-417.000.
Silber, Dieter; Sawitzki, Friedhelm; and Roy, Kurt, 4,618,781, Cl. 307-252.00C.

Lichtenberg, Wolfgang, to WABCO Westinghouse Fahrzeugbremsen GmbH. Pilot-operated solenoid valve apparatus. 4,617,961, Cl. 137-596.160.

Lichtenthaler, Frieder W.; and Klimesch, Roger G., to Suddeutsche Zucker-Aktiengesellschaft. Derivatives and reduction products of D-glucopyranosyl-alpha(1→5)-d-arabinonic acid; and production of same. 4,618,675, Cl. 536-17.200.

Liebert, Karl-Heinz; and Wiedemann, Erwin, to Zahnradfabrik Friedrichshafen, AG. Hydraulic auxiliary power steering for motor vehicles. 4,618,017, Cl. 180-133.000.

Liedtke, Kurt: *See*—
Focke, Heinz; and Liedtke, Kurt, 4,617,780, Cl. 53-466.000.

Liftomatic Material Handling Co., Inc.: *See*—
Dorsch, William J., 4,618,306, Cl. 414-420.000.

Lightowlers, Richard J.: *See*—
Triggs, Geoffrey W.; Lightowlers, Richard J.; Robinson, Derek; and Rice, Graham, 4,617,985, Cl. 165-32.000.

Ligon, James T. Washer cutting procedure. 4,617,849, Cl. 83-18.000.

Lima, Joseph D.: *See*—
Hindman, David B.; Paduchowski, James S.; and Lima, Joseph D., 4,618,431, Cl. 210-741.000.

Linde Aktiengesellschaft: *See*—
Kropp, Walter, 4,617,854, Cl. 91-517.000.
Krusche, Alfred; and Kropp, Walter, 4,617,798, Cl. 60-450.000.

Linder, Donald L.; and Carney, Scott N., to Motorola, Inc. Apparatus and method for generating filtered multilevel data from NRZ data. 4,618,941, Cl. 364-724.000.

Lindsay Manufacturing Company: *See*—
Meis, Charles H.; and Overvaag, Duane B., 4,618,102, Cl. 239-737.000.

Lindstrom, Paul, to Stal Refrigeration AB. Device for fixing a thrust bearing. 4,618,272, Cl. 384-517.000.

Linkies, Adolf; and Reuschling, Dieter, to Hoechst Aktiengesellschaft. Process for preparing crystalline salts of acetoacetamide-N-sulfofluoride. 4,618,455, Cl. 260-543.00F.

Linton, Nancy J.: *See*—
Fadner, Thomas A.; and Linton, Nancy J., 4,618,151, Cl. 273-148.00A.

Lion Corporation: *See*—
Maeyama, Tsutomu; Ishii, Shigeru; and Kaneko, Kenji, 4,618,488, Cl. 424-49.000.

Lister, Clive R. B. Self-orienting directionally sensitive geophone. 4,618,949, Cl. 367-171.000.

Little, Wendell; and Williams, Tim, to Motorola, Inc. Dual page memory system having storage elements which are selectively swapped between the pages. 4,618,946, Cl. 365-189.000.

Liu, Kuo-Ching, to Quantronix Corporation. Frequency doubling a laser beam by using intracavity type II phase matching. 4,618,957, Cl. 372-22.000.

Liu, Shuchen: *See*—
Walls, John E.; and Liu, Shuchen, 4,618,562, Cl. 430-157.000.

Liu, Wan-Li, to General Electric Company. Novel silicone-containing interpenetrating polymer networks. 4,618,644, Cl. 524-535.000.

Livelli, Thomas: *See*—
Malavarca, Richard; and Livelli, Thomas, 4,618,408, Cl. 204-299.00R.

Livesay, Richard E.: *See*—
Garman, James A.; Swift, Stephen D.; Livesay, Richard E.; and Arians, Arlyn J., 4,618,190, Cl. 305-39.000.

Lloyd, Norman E.: *See*—
Johnson, Richard A.; Antrim, Richard L.; and Lloyd, Norman E., 4,618,584, Cl. 435-234.000.

Lobmann, Michele: *See*—
Delgoffe, Jean-Claude; Lobmann, Michele; and Zygraich, Nathan, 4,618,493, Cl. 424-89.000.

Loermans, Peter J. G., to Meco Equipment Engineers B.V. Galvanotechnical device for locally applying a metal layer to an elongate metal tape or the like. 4,618,407, Cl. 204-206.000.

LOF Plastics Inc.: *See*—
McFarland, James H., 4,618,114, Cl. 248-65.000.

Lohmeijer, Johannes H. G. M.; Noordermeer, Jacobus W. M.; and Bussink, Jan, to General Electric Company. Polymer mixture which comprises a polyphenylene ether and a dihydrazide as a stabilizer. 4,618,637, Cl. 524-192.000.

Lohse, Friedrich: *See*—
Stockinger, Friedrich; Lohse, Friedrich; and Moser, Roland, 4,618,712, Cl. 564-103.000.

Lombardo, Nicholas J.: *See*—
Hazen, Wayne W.; Thompson, David L.; Reynolds, James E.; Lombardo, Nicholas J.; Queneau, Paul B.; and Hager, John P., 4,618,480, Cl. 423-127.000.

Loose, Gunter: *See*—
Abthoff, Jorg; Schuster, Hans-Dieter; Loose, Gunter; and Ebinger, Gunther, 4,617,795, Cl. 60-276.000.

Lorch, Werner, to Hans Grohe GmbH & Co. KG. Control insert for sanitary mixer valves. 4,617,965, Cl. 137-625.170.

L'Oreal: *See*—
Gueret, Jean-Louis H., 4,617,948, Cl. 132-88.500.

Lorenz, Werner: *See*—
Steinke, Gerhard; Fels, Peter; Hoeg, Wolfgang; Lorenz, Werner; Ahnert, Wolfgang; Steffen, Frank; and Reichardt, Walter, 4,618,987, Cl. 381-82.000.

Lorenzetti-Inebrasa S/A.: *See*—
Heyde, Hans H.; and Echeverria, Julio A., 4,618,753, Cl. 200-148.00G.

Lortz, Allan R.: *See*—
Anthony, James R.; and Lortz, Allan R., 4,617,705, Cl. 24-642.000.

Lourens, Pieter A.: *See*—
Heijnen, Joseph J.; Lourens, Pieter A.; and Vixseboxse, Albertus J., 4,618,418, Cl. 210-151.000.

Lousberg, Pierre, to Societe Anonyme des Ateliers Houget Duesberg Bosson. Apparatus for monitoring and restarting the cut yarn during the replacement of full bobbins on the spindles of a continuous spinning machine. 4,617,791, Cl. 57-299.000.

Loutfy, Rafik O.: *See*—
Stolka, Milan; Pai, Damodar M.; Smith, Thomas W.; Duff, James M.; and Loutfy, Rafik O., 4,618,551, Cl. 430-58.000.

Lovegrove, Peter C., to United Kingdom Atomic Energy Authority. Electrophoretic separator. 4,618,409, Cl. 204-300.00R.

Lowry, Ron. Adjustable apparatus and method for assisting in motor vehicle engine repair. 4,618,029, Cl. 182-116.000.

Lu, Neng-hsing: *See*—
Babu, Suryadevara V.; Horwath, Ronald S.; Lu, Neng-hsing; and Welsh, John A., 4,618,477, Cl. 422-186.290.

Lubitz, Karl: *See*—
Mohaupt, Jutta; Lubitz, Karl; Schnoeller, Manfred; and Wersing, Wolfram, 4,617,707, Cl. 29-25.350.

Lubrizol Corporation, The: *See*—
Higgins, William A., 4,618,450, Cl. 252-355.000.
Jahnke, Richard W.; and Woerner, William C., 4,618,539, Cl. 428-470.000.

Lucas Electrical Electronics and Systems Ltd.: *See*—
Hill, William F., 4,617,905, Cl. 123-614.000.

Lucas Industries, Public Limited Company: *See*—
Hill, William F., 4,617,906, Cl. 123-617.000.

Ludington, Paul D.; and White, Ian A., to AT&T Bell Laboratories. Optical fiber splicing using leaky mode detector. 4,618,212, Cl. 350-96.210.

Luetzelschwab, Wayne E., to Marathon Oil Company. Polymer flow control apparatus. 4,617,991, Cl. 166-53.000.

Luk Lamellen und Kupplungsbau GmbH: *See*—
Kinz, Peter, 4,618,047, Cl. 192-89.00B.

Lummus Industries, Inc.: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; and Beeland, William D., 4,617,862, Cl. 100-53.000.

Lundblad, Karl A., to MonoCarb AB. Monoclonal antibody formulation for diagnostic use. 4,618,486, Cl. 424-11.000.

Lundin, Ingvar. Rotary vacuum filter with adjustable immersion angle. 4,618,424, Cl. 210-396.000.

Luzzi, John J.: *See*—
Steinberg, David H.; Luzzi, John J.; and Cortolano, Frank P., 4,618,440, Cl. 252-48.200.

Lyon, Richard A.: *See*—
Dale, Steven M.; Lyon, Richard A.; and Schutram, David P., 4,618,198, Cl. 339-60.00M.

Lyons, James E.: *See*—
Duggan, D. Michael; Lyons, James E.; and Myers, Harry K., Jr., 4,618,729, Cl. 568-678.000.

Lyszczarz, Theodore M.: *See*—
Flanders, Dale C.; and Lyszczarz, Theodore M., 4,618,261, Cl. 356-357.000.

Ma, John. CATV converter having improved tuning circuits. 4,619,000, Cl. 455-131.000.

MABEG Maschinenbau GmbH & Company: *See*—
Greiner, Harry; and Schwebel, Adolf, 4,618,135, Cl. 271-9.000.

Mabey, Peter J.: *See*—
Sharpe, Anthony K.; and Mabey, Peter J., 4,618,955, Cl. 371-37.000.

MacFarlane, William: *See*—
Barnes, Andrew; Elliott, Gary K.; MacFarlane, William; and Pheasant, Stephen T., 4,618,079, Cl. 222-591.000.

Mach, Stanley R. Rotary engine. 4,617,886, Cl. 123-223.000.

MacIsaac, Andrew B.: *See*—
Kozyra, William L.; MacIsaac, Andrew B.; and Santoro, Vincent J., 4,618,159, Cl. 280-93.000.

MacIver, Bernard A.; Erskine, James C., Jr.; and Bierlein, John C., to General Motors Corporation. Method of making adherent score-resistant coating for metals. 4,618,505, Cl. 427-38.000.

Madan, Gulzari L.; and Rao, Bookinkere C. S., to Lever Brothers Company. Peroxide bleach and compositions comprising said bleach. 4,618,445, Cl. 252-99.000.

Maeda, Naoyuki, to Tokai TRW & Co., Ltd. Apparatus for converting single-phase power to three-phase outputs. 4,618,809, Cl. 318-768.000.

Maeda, Yasushi: *See*—
Hatakeyama, Iwao; Maeda, Yasushi; Ishii, Osamu; and Yoshii, Shizuka, 4,618,901, Cl. 360-114.000.

Maekawa, Yukio; and Mukunoki, Yasuo, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,618,575, Cl. 430-634.000.

Maeno, Tsuyoshi: *See*—
Sakakibara, Hiroyuki; Akita, Shigeyuki; Kodera, Masao; and Maeno, Tsuyoshi, 4,618,948, Cl. 367-104.000.

Maeyama, Tsutomu; Ishii, Shigeru; and Kaneko, Kenji, to Lion Corporation. Toothpaste composition. 4,618,488, Cl. 424-49.000.

Magee, Robert D.; Asztalos, Michael J.; and Trinh, Vuong D., to Westinghouse Electric Corp. Method of testing the operability of check valves. 4,618,824, Cl. 324-208.000.

Magyar, Karoly: *See*—
Budai, Zoltan; Benko, Pal; Ratz nee Simonek, Ildiko ; Rakoczy nee Pinter, Eva; Magyar, Karoly; Kelemen, Jozsef; and Mandi, Attila, 4,618,623, Cl. 514-478.000.

Maharaj, Kenrick B.: *See*—
Palfery, Kenneth J.; Puckering, Donald R.; Kocev, Angel; and Maharaj, Kenrick B., 4,617,720, Cl. 29-568.000.

Mahoney, Thomas P.: *See*—
Campbell, James R., 4,618,152, Cl. 277-53.000.

Maier, Ludwig, to Ciba-Geigy Corporation. Herbicidal N-2-(nitro-5-phenoxy-phenyl)-aminoalkylphosphonic acid and esters. 4,618,358, Cl. 71-86.000.

Maier, Peter: *See*—
Niedermaier, Arnold; and Maier, Peter, 4,617,864, Cl. 101-219.000.

Maile, Donald W., to RCA Corporation. Electrical controller having a window discriminator. 4,618,770, Cl. 250-338.000.

Maiorana, Stefano: *See*—
Brandi, Gabriella; Koch, Paolo; Maiorana, Stefano; Dalla Croce, Piero; and Baldoli, Clara, 4,618,439, Cl. 252-47.500.

Maitani, Yoshihisa; Tsunefuji, Katsuhiko; and Yamasaki, Masafumi, to Olympus Optical, Co. Ltd. Camera. 4,618,238, Cl. 354-431.000.

Makino, Masami: *See*—
Miyake, Ryota; and Makino, Masami, 4,618,854, Cl. 340-567.000.

Makino, Shigeru; Katagi, Takashi; Urasaki, Shuji; Kawabata, Shunichiro; and Kobayashi, Yuji, to Mitsubishi Denki Kabushiki Kaisha. Dual reflector antenna system. 4,618,866, Cl. 343-779.000.

Makita, Fujio: *See*—
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, 4,617,840, Cl. 74-865.000.

Makiura, Yoshinori: *See*—
Hisajima, Masahiko; Shigemura, Yutaka; Makiura, Yoshinori; and Ishito, Mitsuya, 4,618,252, Cl. 355-55.000.

Malas, James C.: *See*—
Gegel, Harold L.; Malas, James C.; Prasad, Yellapregada V. R. K.; Doraivelu, Sokka M.; Barker, Douglas R.; Morgan, James T., Jr.; and Lark, Kristine A., 4,617,817, Cl. 72-364.000.

Malavarca, Richard; and Livelli, Thomas, to Lab Stuff, Inc. Casting apparatus for electrophoretic gel tray. 4,618,408, Cl. 204-299.00R.

Malko, John A., to North American Philips Corporation. Flexible surface coil for magnetic resonance imaging. 4,617,936, Cl. 128-653.000.

Mampaeij, Johannes J. Method of unloading a vessel by means of a crane arranged on an offshore platform and a crane adapted to carry out this method. 4,618,179, Cl. 294-82.310.

Mandi, Attila: *See*—
Budai, Zoltan; Benko, Pal; Ratz nee Simonek, Ildiko ; Rakoczy nee Pinter, Eva; Magyar, Karoly; Kelemen, Jozsef; and Mandi, Attila, 4,618,623, Cl. 514-478.000.

Mandt, Mikkel G. Retrievable jet mixing systems. 4,618,426, Cl. 210-620.000.

Manes, Michael R., to Aspen Laboratories, Inc. Electrosurgical unit. 4,617,927, Cl. 128-303.140.

Mannesmann, Gerda: *See*—
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Mannesmann, Gerda; Nieuweboer, Bob; and Town, Michael-Harold, 4,618,626, Cl. 514-530.000.

Mannesmann Kienzle GmbH: *See*—
Donner, Bernd; Schultze, Hartmut; and Jahnig, Lutz, 4,617,893, Cl. 123-361.000.

Manning, George H., to Memtec Corporation. Magnetic tape cassette isolator. 4,618,904, Cl. 360-132.000.

Manservisi, Renato, to SASIB S.p.A. Compression drum for cigarettes. 4,617,783, Cl. 53-529.000.

Mansour, Mansour N., to Southers California Edison. Method and burner tip for suppressing emissions of nitrogen oxides. 4,618,323, Cl. 431-177.000.

Manzer, Dennis G.: *See*—
Ish-Shalom, Jehuda; Katz, Leonard A.; and Manzer, Dennis G., 4,618,808, Cl. 318-696.000.

Manzoni, Angelo: *See*—
Premoli, Pietro; Manzoni, Angelo; and Calzi, Claudio, 4,618,587, Cl. 436-74.000.

Mao, James. Collapsible and movable support for wardrobe. 4,618,035, Cl. 190-18.00A.

Maranantha Research Ltd.: *See*—
Wilson, Michael A., 4,618,835, Cl. 331-65.000.

Marathon Oil Company: *See*—
Luetzelschwab, Wayne E., 4,617,991, Cl. 166-53.000.

Marcus, Ilan, to Du Pont de Nemours, E. I., and Company. Polyester fiberfill and process. 4,618,531, Cl. 428-283.000.

Maria, Edmond: *See*—
Franzolini, Marc; Maria, Edmond; Vanderschaeghe, Alain; and Bezier, Jean, 4,617,990, Cl. 165-173.000.

Maringer, Robert E., to Battelle Development Corporation. Method and apparatus for strip casting. 4,617,981, Cl. 164-453.000.

Marker, Richard L.: *See*—
Miller, Gary T.; Marker, Ronald E.; and Marker, Richard L., 4,617,856, Cl. 92-71.000.

Marker, Ronald E.: *See*—
Miller, Gary T.; Marker, Ronald E.; and Marker, Richard L., 4,617,856, Cl. 92-71.000.

Markin, Charles, to Duracell Inc. Leak resistant non-tacky sealant. 4,618,547, Cl. 429-174.000.

Marks, Alvin M. Device and method for the reclamation of polluted land areas. 4,618,284, Cl. 405-129.000.

Markunas, Albert L.: *See*—
Seidel, William E.; Markunas, Albert L.; and Nelson, Thomas A., 4,617,958, Cl. 137-492.500.

Marquardt GmbH: *See*—
Schaffeler, Alois, 4,618,747, Cl. 200-67.0PK.

Marra, Michael: *See*—
Li, Lehmann K.; and Marra, Michael, 4,618,086, Cl. 227-19.000.

Marsh, John: *See*—
Petts, Nigel J.; and Marsh, John, 4,617,954, Cl. 137-110.000.

Marten, Finn L., to Air Products and Chemicals, Inc. Copolymers of vinyl alcohol and poly(alkyleneoxy)acrylates. 4,618,648, Cl. 525-60.000.

Martens, Theodorus H. G.: *See*—
Temple, James S.; Legierse, Petrus E. J.; and Martens, Theodorus H. G., 4,618,506, Cl. 427-40.000.

Martin, Hubert C., Jr., to Sperry Corporation. Topology for miniature power supply with low voltage and low ripple requirements. 4,618,919, Cl. 363-21.000.

Martin, Jean G. M.: *See*—
Michel, Dominique; Johnson, Delbert B.; Pages, Jean F.; Foglia, Vincent F. P.; Martin, Jean G. M.; Vache , Michel P.; Sedillot, Francois G.; and Crull, Carroll M., 4,618,286, Cl. 405-208.000.

Martin, Raymond G.; and Mims, James H., to Westinghouse Electric Corp. Radar channel including an orthogonal MTI filter pair. 4,618,864, Cl. 342-162.000.

Martock Design Limited: *See*—
Hall, Kenneth F.; and Chambers, George, 4,617,833, Cl. 74-110.000.

Mascitti, Albert A.: *See*—
Sulkowski, Theodore S.; Silver, Paul J.; and Mascitti, Albert A., 4,618,678, Cl. 546-123.000.

Mase, Toshiyasu: *See*—
Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; and Tomioka, Kenichi, 4,618,627, Cl. 514-678.000.

Mashino, Keiichi; Satou, Morio; Masumoto, Shouji; Kobayashi, Kunio; and Miki, Osamu, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Voltage regulator for charging generator. 4,618,811, Cl. 322-28.000.

Mason, Gary E.: *See*—
Gordon, Arnold Z.; Morris, Jerry L.; and Mason, Gary E., 4,618,503, Cl. 427-11.000.

Mason, Robert K.: *See*—
Simonton, Robert D.; Cattano, John D.; and Mason, Robert K., 4,618,546, Cl. 429-133.000.

Masonite Corporation: *See*—
Pittman, Raymond H.; and Schultz, William J., 4,617,774, Cl. 52-521.000.

Massachusetts Institute of Technology: *See*—
Flanders, Dale C.; and Lyszczarz, Theodore M., 4,618,261, Cl. 356-357.000.

Masumoto, Shouji: *See*—
Mashino, Keiichi; Satou, Morio; Masumoto, Shouji; Kobayashi, Kunio; and Miki, Osamu, 4,618,811, Cl. 322-28.000.

Masuno, Hiroshi: *See*—
Okuda, Hiromichi; Masuno, Hiroshi; Aburada, Masaki; Takeda, Shigefumi; Itoh, Eiko; Matsushita, Moe; and Hosoya, Eikichi, 4,618,495, Cl. 424-195.100.

Matex Co., Ltd.: *See*—
Matoba, Hideyasu, 4,617,839, Cl. 74-801.000.

Mathad, Gangadhara S.: *See*—
Geldermans, Pieter; and Mathad, Gangadhara S., 4,617,730, Cl. 29-843.000.

Mathewes, William D.: *See*—
Hagerman, James E.; Mathewes, William D.; Rees, Fenton L.; and Flack, Albert J., 4,618,810, Cl. 318-803.000.

Matoba, Hideyasu, to Matex Co., Ltd. Asymmetric planetary gear assembly. 4,617,839, Cl. 74-801.000.

Matsuda, Ikuo: *See*—
Todokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, 4,617,799, Cl. 60-602.000.

Matsuda, Yasumasa: *See*—
Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, 4,618,868, Cl. 346-75.000.

Matsumoto, Masafumi: *See*—
Kotani, Matahira; and Matsumoto, Masafumi, 4,618,869, Cl. 346-75.000.

Matsumoto, Takaharu: *See*—
Ogawa, Takahiro; Takada, Masahiko; Matsumoto, Takaharu; and Kanbara, Youichi, 4,618,469, Cl. 264-182.000.
Matsumoto, Yutaka, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for driving camshafts in an internal combustion engine. 4,617,882, Cl. 123-90.310.
Matsumura, Mitsuie; Yoshimura, Motomu; and Urushibata, Hiroaki, to Mitsubishi Denki Kabushiki Kaisha. Fused carbonate-type fuel cell. 4,618,543, Cl. 429-19.000.
Matsunaga, Shinichi: *See*—
Fujitani, Yoshiyasu; Muraki, Hideaki; Yokota, Koji; Sobukawa, Hideo; and Matsunaga, Shinichi, 4,617,794, Cl. 60-274.000.
Matsuoka, Yoshitaka: *See*—
Takahashi, Yukio; Shimazoe, Michitaka; and Matsuoka, Yoshitaka, 4,618,844, Cl. 338-2.000.
Matsushima, Masaaki: *See*—
Takano, Katsuhiko; Iijima, Shigeharu; Yoshihara, Satoshi; Matsushima, Masaaki; Kishi, Hiroyoshi; and Sasamori, Eizo, 4,618,537, Cl. 428-336.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Kakuda, Yoshitaka; and Kondoh, Norimasa, 4,618,790, Cl. 310-90.000.
Kane, Johji, 4,619,001, Cl. 455-192.000.
Nishida, Yoshikazu; and Hashimoto, Isamu, 4,617,843, Cl. 81-57.110.
Matsushita Electric Works, Ltd.: *See*—
Yamamoto, Hideomi; Watanabe, Haruzo; Kishie, Hidehiko; and Nishihara, Toshio, 4,617,717, Cl. 29-527.400.
Matsushita, Moe: *See*—
Okuda, Hiromichi; Masuno, Hiroshi; Aburada, Masaki; Takeda, Shigefumi; Itoh, Eiko; Matsushita, Moe; and Hosoya, Eikichi, 4,618,495, Cl. 424-195.100.
Matsuura, Takeshi: *See*—
Morioka, Akira; Matsuura, Takeshi; and Takahira, Yoshiyuki, 4,618,536, Cl. 428-329.000.
Matsuura, Yoshiaki, to Kabushiki Kaisha Daini Seikosha. Low-power consumption reference pulse generator. 4,618,837, Cl. 331-160.000.
Matsuzaki, Michiyoshi, to Nippon Piston Ring Co., Ltd. Rotary type fluid compressor. 4,618,317, Cl. 418-63.000.
Mattei, Riccardo; and Natali, Roberto, to G. D. Societa per Azioni. Method for wrapping batches of stacked products so as to form sealed packets. 4,617,782, Cl. 53-479.000.
Mattei, Riccardo, to G.D Societa' per Azioni. Cigarette manufacturing machine. 4,617,943, Cl. 131-109.300.
Mattern, Kenneth E.: *See*—
Paice, Derek A.; and Mattern, Kenneth E., 4,618,906, Cl. 361-5.000.
Maxel, John M. Golf club having interchangeable face plates. 4,618,149, Cl. 273-79.000.
Maxwell, Duane S.; Phillips, Roger; and Schwan, Eduard A., to Teleplex Corporation. Monitoring of data transfer system having serially distributed data ports. 4,618,965, Cl. 375-10.000.
May & Baker Limited: *See*—
Cramp, Michael C.; Gilmour, James; and Parnell, Edgar W., 4,618,366, Cl. 71-94.000.
Maydan, Dan; Somekh, Sasson; and Kaczorowski, Edward M., to Applied Materials, Inc. Laser interferometer system and method for monitoring and controlling IC processing. 4,618,262, Cl. 356-357.000.
Mayo, Terry H.: *See*—
Badrak, Robert P.; and Mayo, Terry H., 4,618,269, Cl. 384-95.000.
Mayol, Robert F.; and Gammans, Richard E., to Mead Johnson & Company. Benzanilide derivative. 4,618,680, Cl. 546-234.000.
Mazda Motor Corporation: *See*—
Sasaki, Junzo; Hitomi, Mitsuo; and Kazuhiko, Ueda, 4,617,897, Cl. 123-432.000.
Sotoyama, Kaoru; Sumida, Shizuo; and Kikuchi, Toshiyuki, 4,618,041, Cl. 192-0.044.
Todokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, 4,617,799, Cl. 60-602.000.
Tokuda, Makoto; and Kimoto, Takami, 4,618,181, Cl. 296-191.000.
Yamamoto, Koichi, 4,618,042, Cl. 192-0.044.
Mazoff, Stanley S.: *See*—
Fish, Aaron M.; D'Intino, Adamo M.; Moessner, Frank G.; and Mazoff, Stanley S., 4,617,810, Cl. 70-14.000.
MBB GmbH: *See*—
Czichy, Reinhard; and Goeschel, Wilhelm, 4,618,259, Cl. 356-152.000.
McAllister, Jerome W.: *See*—
Chamberlain, Craig S.; Vesley, George F.; Zimmerman, Patrick G.; and McAllister, Jerome W., 4,618,525, Cl. 428-209.000.
McAuliffe, Charles A.: *See*—
Benn, Frederick R.; and McAuliffe, Charles A., 4,618,736, Cl. 585-240.000.
McCauley, Lewis D.: *See*—
Bainbridge, Gary R.; McCauley, Lewis D.; and Taylor, John H., 4,618,299, Cl. 411-374.000.
McClellan, William J.: *See*—
DeBernardis, John F.; Kerkman, Daniel J.; and McClellan, William J., 4,618,683, Cl. 548-420.000.
McClelland, Sandra K.; and Poliniak, Eugene S., to RCA Corporation. Alignment layer for liquid crystal display. 4,618,514, Cl. 428-1.000.
McClendon, Samuel E.: *See*—
Miller, William H.; McClendon, Samuel E.; Kolodziej, Raymond J.; and Brand, Donald L., 4,618,931, Cl. 364-431.020.
McCord, James W. Sound suppressor in a liquid medium. 4,618,263, Cl. 366-127.000.
McCrary, Mark W. Swivel headed scraping device. 4,617,736, Cl. 30-169.000.
McCully, Kilmer S. N-homocysteine thiolactonyl retinamide and use thereof as an antineoplastic agent. 4,618,685, Cl. 549-63.000.
McDermott International, Inc.: *See*—
Daigle, Verlon C., 4,618,288, Cl. 405-232.000.
McDonnell Douglas Corporation: *See*—
Palfery, Kenneth J.; Puckering, Donald R.; Kocev, Angel; and Maharaj, Kenrick B., 4,617,720, Cl. 29-568.000.
McElfresh, Lloyd. Recumbent vehicle. 4,618,160, Cl. 280-281.0LP.
McEwen, James A.: *See*—
Ens, John; McEwen, James A.; and Beattie, Craig W., 4,618,230, Cl. 351-221.000.
McFarland, James H., to LOF Plastics Inc. Conduit spacer and support. 4,618,114, Cl. 248-65.000.
McGard, Inc.: *See*—
Bainbridge, Gary R.; McCauley, Lewis D.; and Taylor, John H., 4,618,299, Cl. 411-374.000.
McGarry, Errol J. Compounds and compositions. 4,618,618, Cl. 514-368.000.
McGlashen, James N.; and Holroyd, Colin, to Apsley Metals Limited. Moulding apparatus. 4,618,466, Cl. 264-40.600.
McGlogan, Robert R.: *See*—
Cybulski, Laurence P.; and McGlogan, Robert R., 4,617,824, Cl. 73-49.700.
McGraw-Edison Company: *See*—
Stares, James A., 4,617,963, Cl. 137-625.300.
McKee, Randall G.: *See*—
Wilson, Joseph H.; Lasiter, David N.; and McKee, Randall G., 4,618,103, Cl. 241-41.000.
McKinney, Benjamin F., to Oxide & Chemical Corporation. Apparatus for the production of lead oxide. 4,618,478, Cl. 422-198.000.
McMinn, William D. Method and apparatus for repairing automatic transmissions. 4,617,711, Cl. 29-402.080.
McNamara, Thomas F.: *See*—
Pollock, Jerry J.; and McNamara, Thomas F., 4,618,489, Cl. 424-52.000.
McNeilab, Inc.: *See*—
Hecker, Leonard R., 4,618,682, Cl. 548-315.000.
McNeill, James K.: *See*—
McNeill, John M., 4,618,161, Cl. 280-402.000.
McNeill, John M., to McNeill, James K. Towing device. 4,618,161, Cl. 280-402.000.
Mead Corporation, The: *See*—
Muller, Rolf, 4,618,054, Cl. 198-409.000.
Mead Johnson & Company: *See*—
Mayol, Robert F.; and Gammans, Richard E., 4,618,680, Cl. 546-234.000.
Mears, James W., to Grinnel Corporation. Fire protection sprinkler head. 4,618,002, Cl. 169-37.000.
Meco Equipment Engineers B.V.: *See*—
Loermans, Peter J. G., 4,618,407, Cl. 204-206.000.
Medeco Security Locks, Inc.: *See*—
Roop, Stevie C., 4,617,811, Cl. 70-131.000.
Medical Safetec, Inc.: *See*—
Wilson, Joseph H.; Lasiter, David N.; and McKee, Randall G., 4,618,103, Cl. 241-41.000.
Medina, Ramiro; and Sullivan, Jack M., to Tennessee Valley Authority. Cyclotriphosphazatriene-derivatives. 4,618,691, Cl. 558-80.000.
Medosan Industrie Biochimiche Riunite S.p.A.: *See*—
Baglioni, Alessandro, 4,618,612, Cl. 514-265.000.
Meis, Charles H.; and Overvaag, Duane B., to Lindsay Manufacturing Company. Drive for movable irrigation system and the like. 4,618,102, Cl. 239-737.000.
Meisel, Michael; and Wiendl, Heinz, to Siemens Aktiengesellschaft. Direct current tight coupling. 4,618,923, Cl. 363-144.000.
Melgaard, Oluf, to BM Digiflow A/S. Stop or switch valve for fluids. 4,617,955, Cl. 137-240.000.
Melliger, Guido W., to Melliger, Guido W. Coating process and apparatus. 4,617,872, Cl. 118-19.000.
Melton, Geoffrey B.: *See*—
Murch, Michael G.; and Melton, Geoffrey B., 4,618,760, Cl. 219-130.400.
Memtec Corporation: *See*—
Manning, George H., 4,618,904, Cl. 360-132.000.
Mendenhall, Walter M. Adjustable shelf partition. 4,618,063, Cl. 211-184.000.
Mercer, Frank B., to P.L.G. Research Limited. Production of plastic mesh. 4,618,385, Cl. 156-229.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Hausberg, Hans-Heinrich; Bottcher, Henning; Gottschlich, Rudolf; Seyfried, Christoph; and Minck, Klaus-Otto, 4,618,614, Cl. 514-321.000.
Merkle, Walter: *See*—
Wagenseil, Ludwig; and Merkle, Walter, 4,617,853, Cl. 91-505.000.
Merla, Adriano: *See*—
Pasqualini, Bruno; and Merla, Adriano, 4,617,759, Cl. 49-487.000.
Meschi, Luciano. Apparatus for the receiving packing and transferring of sheet material. 4,618,340, Cl. 493-13.000.
Messenger, Edward T.: *See*—
Haslop, William P.; Allonby, John M.; Akred, Brian J.; and Messenger, Edward T., 4,618,446, Cl. 252-135.000.
Messick, Virginia B.: *See*—
Hefner, Robert E., Jr.; and Messick, Virginia B., 4,618,658, Cl. 525-454.000.

Mestrits, Thomas J.: *See—*
Jacobstein, Benjamin L.; Mestrits, Thomas J.; and Miller, Murray. 4,618,229, Cl. 351-161.000.

Meta, Frank. Scraper and scrubber for fruits, vegetables and the human body. 4,617,696, Cl. 15-236.00R.

Metacon AG: *See—*
Tinnes, Bernhard; Knell, Bernhard; and Vetterli, Walter, 4,618,126, Cl. 266-271.000.

Metal Box Public Limited Company: *See—*
Rickett, Roger G.; and Spooner, Eric, 4,618,052, Cl. 198-370.000.

Metropolitan Wire Corporation: *See—*
Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, 4,618,067, Cl. 220-1.500.

Metzeler Kautschuk GmbH: *See—*
Hartel, Volker; and Theisen, Dieter, 4,618,128, Cl. 267-140.100.

Meyer, Marjorie A.; and Moore, John D. Drain pipe cleaning tool. 4,617,693, Cl. 15-104.3SN.

Meyer, Willy: *See—*
Gass, Karl; Fory, Werner; Meyer, Willy; and Topfl, Werner, 4,618,363, Cl. 71-90.000.

Michel, Dominique; Johnson, Delbert B.; Pages, Jean F.; Foglia, Vincent F. P.; Martin, Jean G. M.; Vache , Michel P.; Sedillot, Francois G.; and Crull, Carroll M., to Fluor-Doris Incorporated. Composite platform for petroleum workings in polar seas. 4,618,286, Cl. 405-208.000.

Michelson, Herbert D., to Exxon Research & Engineering Co. Method of multi-stage compressor surge control. 4,618,310, Cl. 415-1.000.

Michio Kawata, Director-General of Agency of Industrial Science and Technology: *See—*
Tsukune, Hideo; and Goto, Keisuke, 4,618,989, Cl. 382-25.000.

Miczek, Ludwik: *See—*
Saternus, Antoni; Miczek, Ludwik; and Bartnik, Mieczyslaw, 4,618,376, Cl. 134-26.000.

Mienko, David K.: *See—*
Wrobleski, David L.; Mienko, David K.; and Leigh-Monstevens, Keith V., 4,617,855, Cl. 92-5.00R.

Mihai, Adrian: *See—*
Hascal, Marcel; Mihai, Adrian; and Hanrahan, Robert C., 4,618,774, Cl. 250-364.000.

Mihayashi, Keiji; Kobayashi, Hidetoshi; and Takada, Shunji, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,618,572, Cl. 430-543.000.

Mihayashi, Keiji: *See—*
Ono, Mitsunori; Itoh, Isamu; and Mihayashi, Keiji, 4,618,563, Cl. 430-219.000.

Mikata, Yoshitaka: *See—*
Yamano, Shoji; Mikata, Yoshitaka; Teramoto, Osamu; and Nishide, Kazuhiro, 4,618,012, Cl. 177-25.000.
Yamano, Shoji; Mikata, Yoshitaka; Teramoto, Osamu; and Nishide, Kazuhiro, 4,618,013, Cl. 177-25.000.

Miki, Osamu: *See—*
Mashino, Keiichi; Satou, Morio; Masumoto, Shouji; Kobayashi, Kunio; and Miki, Osamu, 4,618,811, Cl. 322-28.000.

Mikio, Kobayashi. Measuring device for a figure. 4,617,740, Cl. 33-122.000.

Miles Laboratories, Inc.: *See—*
Wang, Joseph Y., 4,618,475, Cl. 422-56.000.

Miley, Steve. Articulated fly swatter. 4,617,754, Cl. 43-137.000.

Miller, Dye O.; Antunes, August J.; Antunes, Jerome; and Godsen, Ronald, to A. J. Antunes & Co. Top-firing food steamer. 4,617,908, Cl. 126-20.000.

Miller, Gary T.; Marker, Ronald E.; and Marker, Richard L., to General Motors Corporation. Swash plate compressor having integral shoe and ball. 4,617,856, Cl. 92-71.000.

Miller, Griffith C., to Dr. Miller's Health Care Products, Inc. Foot hygiene device. 4,617,917, Cl. 128-62.00R.

Miller, Jack E.: *See—*
Dopyera, Emil E.; and Miller, Jack E., 4,618,173, Cl. 285-261.000.

Miller, Joseph M.; Fannin, Stephen W.; and Steiner, Paul R., to Akron City Hospital. Portable circuit and method for performing a time study and analysis of bodily ionic characteristics. 4,618,929, Cl. 364-415.000.

Miller, Leonidas C.: *See—*
Hutson, Clifford L.; and Miller, Leonidas C., 4,618,178, Cl. 294-64.100.

Miller, Michael J.: *See—*
Chupp, John P.; and Miller, Michael J., 4,618,713, Cl. 564-214.000.

Miller, Murray: *See—*
Jacobstein, Benjamin L.; Mestrits, Thomas J.; and Miller, Murray, 4,618,229, Cl. 351-161.000.

Miller, William H.; McClendon, Samuel E.; Kolodziej, Raymond J.; and Brand, Donald L., to United States of America, Air Force. Gas generator fuel flow throttle control system. 4,618,931, Cl. 364-431.020.

Millipore Corporation: *See—*
Steuck, Michael J., 4,618,533, Cl. 428-315.700.

Millmaster Onyx Group, Inc.: *See—*
Green, Harold A.; and Weinstein, Morris, 4,618,370, Cl. 106-111.000.

Mills, David, to Rolls-Royce Limited. Ceramic casting mould and a method for its manufacture. 4,617,977, Cl. 164-30.000.

Mims, James H.: *See—*
Martin, Raymond G.; and Mims, James H., 4,618,864, Cl. 342-162.000.

Minami, Shinzaburo: *See—*
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,618,606, Cl. 514-202.000.

Minck, Klaus-Otto: *See—*
Hausberg, Hans-Heinrich; Bottcher, Henning; Gottschlich, Rudolf; Seyfried, Christoph; and Minck, Klaus-Otto, 4,618,614, Cl. 514-321.000.

Miner Enterprises, Inc.: *See—*
Wahlstrom, Merle D.; and Votaw, Brian T., 4,617,868, Cl. 105-.000.

Minnesota Mining and Manufacturing Company: *See—*
Chamberlain, Craig S.; Vesley, George F.; Zimmerman, Patrick G.; and McAllister, Jerome W., 4,618,525, Cl. 428-209.000.
Ofstead, Ronald F., 4,618,649, Cl. 525-60.000.

Minnesota Scientific, Inc.: *See—*
LeVahn, Bruce A.; and Olson, Robert E., 4,617,916, Cl. 128-20.000.

Minolta Camera Kabushiki Kaisha: *See—*
Ishida, Tokuji; and Hamada, Masataka, 4,618,235, Cl. 354-403.000.
Ohashi, Masato; Kashioka, Motohiko; Tamura, Shinichi; Katsura, Hiromitsu; Ueda, Hideaki; and Nakamura, Akihiro, 4,618,554, Cl. 430-78.000.

Minor, James C., to Eastman Kodak Company. Corona-charging apparatus. 4,618,249, Cl. 355-14.0CH.

Mintz, Donald J.; and Gleason, Anthony M., to Exxon Research and Engineering Co. Method and apparatus for charging a contaminant-laden liquid. 4,618,432, Cl. 210-748.000.

Miranti, Joseph P., Jr., to Dayco Corporation. Belt pulley and method of making the same. 4,618,334, Cl. 474-93.000.

Miree, Mallory F. Apparatus for mounting flashlights to bicycles. 4,618,081, Cl. 224-41.000.

Miro, Nemesio D.: *See—*
Kaus, Malcolm J.; and Miro, Nemesio D., 4,618,661, Cl. 526-114.000.

Miszkowski, Nancy A.: *See—*
White, Lawrence K.; Miszkowski, Nancy A.; and Levine, Aaron W., 4,618,565, Cl. 430-271.000.

Mita Industrial Co., Ltd.: *See—*
Hisajima, Masahiko; Shigemura, Yutaka; Makiura, Yoshinori; and Ishito, Mitsuya, 4,618,252, Cl. 355-55.000.

Mitchell, John W. J.: *See—*
Rand, Roy E.; Mitchell, John W. J.; and Couch, John L., 4,618,970, Cl. 378-10.000.

Mitlehner, Heinz, to Siemens Aktiengesellschaft. Schottky power diode. 4,618,871, Cl. 357-15.000.

Mito, Ikuo, to NEC Corporation. Double heterostructure semiconductor laser with periodic structure formed in guide layer. 4,618,959, Cl. 372-46.000.

Mitsubishi Chemical Ind., Ltd.: *See—*
Suzuki, Tetsumi; Murayama, Tetsuo; Ono, Hitoshi; Aramaki, Shinji; and Yokoyama, Michiyo, 4,618,555, Cl. 430-78.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Badono, Shinji; and Tsutaka, Yoshikazu, 4,618,969, Cl. 377-49.000.
Ikeda, Akira; Nakayama, Shigeki; Ishii, Toshitsugu; and Itakura, Isao, 4,617,755, Cl. 47-65.000.
Kotera, Yoshikazu, 4,617,814, Cl. 72-8.000.
Makino, Shigeru; Katagi, Takashi; Urasaki, Shuji; Kawabata, Shunichiro; and Kobayashi, Yuji, 4,618,866, Cl. 343-779.000.
Matsumura, Mitsuie; Yoshimura, Motomu; and Urushibata, Hiroaki, 4,618,543, Cl. 429-19.000.
Ozaki, Yukio; Fujisawa, Osamu; Sakai, Ryukichi; and Hasegawa, Hiroshi, 4,618,752, Cl. 200-148.00R.

Mitsubishi Jukogio Kabushiki Kaisha: *See—*
Sasano, Ryoichiro; Toyohara, Tsutomu; and Takigawa, Toshimichi, 4,617,845, Cl. 82-1.00C.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Hirano, Masahiro; and Miyauchi, Toshio, 4,617,870, Cl. 110-323.000.
Irie, Nobuhiko, 4,618,303, Cl. 414-226.000.
Shinoda, Naoharu; Tatani, Atsushi; Omoto, Setsuo; Okino, Susumu; and Shimizu, Taku, 4,618,482, Cl. 423-242.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See—*
Ohe, Junya; Wakita, Saburo; Yamatsuta, Kiichi; Goto, Shoji; Kutsukake, Yukinori; and Sugizaki, Masuo, 4,618,474, Cl. 420-436.000.

Mitsui Kensetsu Kabushiki Kaisha: *See—*
Takamiya, Shigeo; Inoue, Kazutoshi; and Tsutaya, Kenzo, 4,618,298, Cl. 405-150.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Yatsu, Tadao; and Hinooka, Nobuya, 4,618,386, Cl. 156-242.000.

Mitsui Toatsu Chemicals, Inc.: *See—*
Yamaguchi, Keizaburo; Sugimoto, Kenichi; Tanabe, Yoshimitsu; Kawashima, Saburo; and Yamaguchi, Akihiro, 4,618,714, Cl. 564-329.000.

Miura, Haruo; Nagaoka, Takashi; Abe, Yoshiaki; and Sakata, Souji, to Hitachi, Ltd. Vane angle changing device for an axial fluid machine. 4,618,311, Cl. 415-149.00R.

Miyagi, Yoshimitsu; Hino, Mitsuo; and Eto, Takehiko, to Kabushiki Kaisha Kobe Seiko Sho. Superplastic aluminium alloy sheets. 4,618,382, Cl. 148-415.000.

Miyake, Junichi: *See—*
Nishikawa, Masao; Sakai, Shinzo; and Miyake, Junichi, 4,618,037, Cl. 192-3.300.

Miyake, Ryota; and Makino, Masami, to Takenaka Engineering Co., Ltd. Double eye type crime preventing sensor system. 4,618,854, Cl. 340-567.000.

Miyakoshi, Hiromichi: *See—*
Imazeki, Kazuyoshi; Tanaka, Toshiyuki; and Miyakoshi, Hiromichi, 4,618,997, Cl. 455-76.000.

Miyamoto, Seigo: *See*—
Fukushima, Toshihiko; Miyamoto, Seigo; Sayo, Kosaku; and Emi, Kenji, 4,617,804, Cl. 62-212.000.
Fukushima, Toshihiko; Miyamoto, Seigo; Fujita, Masahiko; Musoo, Masanori; and Sayo, Kosaku, 4,618,092, Cl. 236-92.00B.

Miyamoto, Tetsuya: *See*—
Kayane, Yutaka; Miyamoto, Tetsuya; Omura, Takashi; Sawamoto, Hirokazu; Harada, Naoki; and Takeshita, Akira, 4,618,671, Cl. 534-635.000.

Miyasaka, Eiji; Hirose, Iwao; Yamashita, Koji; Kawai, Kenji; and Kanada, Eiji, to Dainippon Screen Mfg., Co., Ltd. Process camera apparatus. 4,618,255, Cl. 355-71.000.

Miyatake, Satoshi; Abe, Mitsuo; and Kume, Masao, to Honda Giken Kogyo Kabushiki Kaisha. Helical gear grinding machine. 4,617,761, Cl. 51-95.0GH.

Miyauchi, Toshio: *See*—
Hirano, Masahiro; and Miyauchi, Toshio, 4,617,870, Cl. 110-323.000.

Mizukoshi, Masataka; and Endo, Teiichi, to Fujitsu Limited. Semiconductor device having adjacent bonding wires extending at different angles. 4,618,879, Cl. 357-74.000.

Mizusawa, Akira: *See*—
Sasaki, Michiaki; and Mizusawa, Akira, 4,618,422, Cl. 210-172.000.

Mladek, Walter: *See*—
Hofmann, Karl; Mladek, Walter; and Kaczynski, Bernhard, 4,618,097, Cl. 239-124.000.

Mliner, David G.: *See*—
Sieb, Lawrence E., Jr.; and Mliner, David G., 4,618,990, Cl. 382-43.000.

Mlynek, Daniel: *See*—
Freyberger, Laurin C.; Mlynek, Daniel; and Schmidtpott, Friedrich, 4,618,881, Cl. 358-27.000.

Mobil Oil Company: *See*—
Horodysky, Andrew G., 4,618,437, Cl. 252-32.500.

Mobil Oil Corporation: *See*—
Chester, Arthur W.; Garwood, William E.; and Tabak, Samuel A., 4,618,737, Cl. 585-329.000.
Doyen, Rene H., 4,618,527, Cl. 428-213.000.
Herrington, Fox J., 4,618,383, Cl. 156-66.000.
Horodysky, Andrew G., 4,618,436, Cl. 252-325.000.
Jennings, Alfred R., Jr., 4,617,997, Cl. 166-299.000.
Nowlin, Thomas E., 4,618,662, Cl. 526-129.000.
Shu, Winston R., 4,617,996, Cl. 166-273.000.

Mobil Solar Energy Corporation: *See*—
Willis, John G., 4,617,722, Cl. 29-572.000.

Mobley, Lawrence R.: *See*—
Gregg, James S.; and Mobley, Lawrence R., 4,618,058, Cl. 206-291.000.

Moczygemba, Mark E.: *See*—
Peel, Harry H.; Brisco, John S.; Moczygemba, Mark E.; Neatherlin, Robert L.; and Sargent, Brenda A., 4,617,937, Cl. 128-680.000.

Modic, Frank J., to General Electric Company. Organosiloxane fabric coating compositions. 4,618,522, Cl. 428-145.000.

Moessner, Frank G.: *See*—
Fish, Aaron M.; D'Intino, Adamo M.; Moessner, Frank G.; and Mazoff, Stanley S., 4,617,810, Cl. 70-14.000.

Mohaupt, Jutta; Lubitz, Karl; Schnoeller, Manfred; and Wersing, Wolfram, to Siemens Aktiengesellschaft. Method for the manufacture of an ultrasonics antenna array. 4,617,707, Cl. 29-25.350.

Mohr, Dieter; and Frass, Werner, to Hoechst Aktiengesellschaft. Process for the electrochemical roughening of aluminum for use as printing plate supports, in an aqueous mixed electrolyte. 4,618,405, Cl. 204-129.750.

Molex Incorporated: *See*—
Olson, Thor, 4,617,733, Cl. 29-874.000.
Silbernagel, Raymond A., 4,618,207, Cl. 339-176.00M.

Molins PLC: *See*—
Arthur, Hugh M.; and Bates, Graham H., 4,618,339, Cl. 493-4.000.

Molitor, Victor D. Method of and device for preventing smoke curling from underneath the hood of a grease extraction ventilator. 4,617,909, Cl. 126-299.00R.

Molnar, William S. Method for applying non-skid coating to metal bars with electric arc or gas flame spray and article formed thereby. 4,618,511, Cl. 427-203.000.

Monarch Marking Systems, Inc.: *See*—
Golicz, Roman M.; Seniff, Dana W.; Fogle, Ronald L.; and Huggins, Orville C., 4,617,784, Cl. 53-540.000.

Monch, Ernst: *See*—
Hasler, Franz; Monch, Ernst; Reiter, Karl; and Timm, Heinrich, 4,618,163, Cl. 280-785.000.

Mondel, Karl: *See*—
Seifert, Helmut; and Mondel, Karl, 4,618,165, Cl. 280-808.000.

MonoCarb AB: *See*—
Lundblad, Karl A., 4,618,486, Cl. 424-11.000.

Monsanto Company: *See*—
Alt, Gerhard H.; Chupp, John P.; and Clizbe, Lane A., 4,618,357, Cl. 71-76.000.
Chupp, John P.; and Miller, Michael J., 4,618,713, Cl. 564-214.000.
DeGeeter, Melvin J.; Lanza, Gregory M.; and Vineyard, Billy D., 4,618,604, Cl. 514-130.000.
Lee, Len F., 4,618,679, Cl. 546-220.000.
Schumacher, Ignatius, 4,618,733, Cl. 568-927.000.

Monti, Gilbert L.: *See*—
Monti, Martha S.; and Monti, Gilbert L., 4,617,691, Cl. 5-434.000.

Monti, Martha S.; and Monti, Gilbert L. Support pillow. 4,617,691, Cl. 5-434.000.

Monticelli, Dennis M., to National Semiconductor Corporation. CMOS ΔV_{BE} bias current generator. 4,618,816, Cl. 323-316.000.

Mooney, Paul C., to Quick-Set Incorporated. Surveillance camera mount. 4,618,886, Cl. 358-108.000.

Moore, John D.: *See*—
Meyer, Marjorie A.; and Moore, John D., 4,617,693, Cl. 15-104.3SN.

Moran, Kenneth T.: *See*—
Ballard, Denis G. H.; Moran, Kenneth T.; and Shirley, Ian M., 4,618,454, Cl. 252-500.000.

More, Henry S., to Develco, Inc. Verification of a surface controlled subsurface actuating device. 4,617,960, Cl. 137-554.000.

Moreau, Eugene J.: *See*—
Schapiro, Norman; and Moreau, Eugene J., 4,618,346, Cl. 44-1.00A.

Morgan, James T., Jr.: *See*—
Gegel, Harold L.; Malas, James C.; Prasad, Yellapregada V. R. K.; Doraivelu, Sokka M.; Barker, Douglas R.; Morgan, James T., Jr.; and Lark, Kristine A., 4,617,817, Cl. 72-364.000.

Mori, Atsushi, to Sanshin Kogyo Kabushiki Kaisha. Fuel and oil mixture producing device for two-cycle engines. 4,617,879, Cl. 123-73.0AD.

Mori, Masaharu; and Asai, Ryuichi, to Clarion Co., Ltd. PSK demodulator using asynchronous local oscillator. 4,618,830, Cl. 329-105.000.

Mori, Toshihiro, to NEC Corporation. Radio paging method of arranging message information with reference to a key code and a base station and a pager receiver for use in the method. 4,618,860, Cl. 340-825.440.

Morimoto, Makoto: *See*—
Hirata, Tadashi; Saito, Hiromitsu; and Morimoto, Makoto, 4,618,687, Cl. 549-396.000.

Morioka, Akira; Matsuura, Takeshi; and Takahira, Yoshiyuki, to Hitachi Maxell, Ltd. Magnetic recording medium. 4,618,536, Cl. 428-329.000.

Morita, Haruyuki; Yoshinari, Jiro; and Nakayama, Masatoshi, to TDK Corporation. Magnetic thin film. 4,618,542, Cl. 428-694.000.

Moriwaki, Masanori: *See*—
Sada, Masao; Kato, Michio; Ayano, Masami; Abe, Tadashi; and Moriwaki, Masanori, 4,618,709, Cl. 562-532.000.

Morrill, Giles W.; and Rice, Stephen G. Rotor assembly with die cast shaft extension coupling. 4,618,791, Cl. 310-90.000.

Morris, Jerry L.: *See*—
Gordon, Arnold Z.; Morris, Jerry L.; and Mason, Gary E., 4,618,503, Cl. 427-11.000.

Morrison, Darrell R.: *See*—
Cooper, Glenn D.; Butler, John M., III; Morrison, Darrell R.; Senic, Charles L.; Nilsson, Lennart S.; and Rowe, Charles M., 4,618,795, Cl. 310-260.000.

MORS: *See*—
Payraudeau, Henri-Andre , 4,618,050, Cl. 194-212.000.

Morton, Lawrence: *See*—
Gesser, Hyman D.; Hunter, Norman R.; and Morton, Lawrence, 4,618,732, Cl. 568-910.500.

Mortvedt, Raymond L.; and Thompson, Steven M., to Ektelon. Racquetball racquet with increased hitting area. 4,618,148, Cl. 273-73.00C.

Moser, Hans, to CIBA-GEIGY Corporation. Acylamides and compositions for the protection of cultivated plants against the phytotoxic action of herbicides. 4,618,361, Cl. 71-88.000.

Moser, Roland: *See*—
Stockinger, Friedrich; Lohse, Friedrich; and Moser, Roland, 4,618,712, Cl. 564-103.000.

Mosiewicz, Antonio, to Cofimco S.r.l. Axial propeller with increased effective displacement of air whose blades are not twisted. 4,618,313, Cl. 416-237.000.

Mossburger, Egon: *See*—
Handtmann, Dieter; Mossburger, Egon; and Forster, Herbert, 4,618,913, Cl. 361-315.000.

Motorenfabrik Hatz GmbH & Co. KG: *See*—
Kampichler, Guenter, 4,617,894, Cl. 123-372.000.

Motorola, Inc.: *See*—
Anttila, Dennis A., 4,618,908, Cl. 361-187.000.
Ecklund, Lawrence M., 4,618,981, Cl. 381-15.000.
Gannon, Mark A.; Yester, Francis R., Jr.; and Gailus, Paul H., 4,618,836, Cl. 331-96.000.
Kelley, Stephen H.; and Rybicki, Mathew A., 4,618,852, Cl. 340-347.0AD.
Linder, Donald L.; and Carney, Scott N., 4,618,941, Cl. 364-724.000.
Little, Wendell; and Williams, Tim, 4,618,946, Cl. 365-189.000.
Sibigtroth, James M., 4,618,968, Cl. 377-39.000.
Thro, Stuart W., 4,619,002, Cl. 455-226.000.

Mourou, Gerard; and Valdmanis, Janis A., to University of Rochester, The. Measurement of electrical signals with subpicosecond resolution. 4,618,819, Cl. 324-77.00K.

MTU Motoren und Turbinen-Union Friedrichshafen GmbH: *See*—
Heberle, Hans-Jorg; and Rudert, Wolfgang, 4,617,903, Cl. 123-501.000.

Mueller, Claus D.: *See*—
Schlecker, Rainer; Schmidt, Peter; Thieme, Peter C.; Lenke, Dieter; Teschendorf, Hans-Jurgen; Traut, Martin; Mueller, Claus D.; Hofmann, Hans P.; and Kreiskott, Horst, 4,618,622, Cl. 514-457.000.

Mueller, Manfred, to Siemens Aktiengesellschaft. Switching device for electrical switching apparatus. 4,618,748, Cl. 200-144.00R.

Muench, Volker; Hambrecht, Juergen; Naarmann, Herbert; Echte, Adolf; and Illers, Karl H., to BASF Aktiengesellschaft. Flame-

proofed thermoplastic molding material comprising a novolak resin. 4,618,636, Cl. 524-176.000.

Muench, Volker; Hambrecht, Juergen; Himmele, Walter; Echte, Adolf; and Swoboda, Johann, to BASF Aktiengesellschaft. Preparation of polyphenylene ethers. 4,618,668, Cl. 528-215.000.

Muench, Volker: *See—*
Taubitz, Christof; Muench, Volker; Hambrecht, Juergen; Echte, Adolf; and Illers, Karl H., 4,618,633, Cl. 524-80.000.

Mug-A-Phone, Inc.: *See—*
Vail, John G., 4,618,066, Cl. 215-12.00R.

Muhle, Michael E.: *See—*
Agapiou, Agapios K.; Muhle, Michael E.; and Kurtzman, Myron B., 4,618,596, Cl. 502-116.000.

Mukai, Ryoichi, to Fujitsu Limited. Method and device for creating an activatable conducting link in a semiconductor device. 4,617,723, Cl. 29-576.00B.

Mukunoki, Yasuo: *See—*
Maekawa, Yukio; and Mukunoki, Yasuo, 4,618,575, Cl. 430-634.000.

Muller, Dietrich: *See—*
Hartan, Hans-Georg; Padberg, Werner; and Muller, Dietrich, 4,618,414, Cl. 209-5.000.

Muller, Gerhard; Hohberg, Gerhard; and Greve, Peter, to Carl-Zeiss-Stiftung. Beam position control for a laser machine device. 4,618,759, Cl. 219-121.0LR.

Muller, Robert L.; and Andersen, Olaf S., to Cornell Research Foundation, Inc. Lipid bilayer membrane electronic circuit components. 4,618,916, Cl. 361-434.000.

Muller, Rolf, to Mead Corporation, The. Equipment for feeding packaging blanks to a packaging machine. 4,618,054, Cl. 198-409.000.

Munakata, Hirohide; Tomida, Yoshinori; Haruta, Masahiro; Hirai, Yutaka; Nishimura, Yukuo; and Hamamoto, Takashi, to Canon Kabushiki Kaisha. Monomolecular record memory medium with photosensitive diazonium salt. 4,618,561, Cl. 430-156.000.

Mundorf, Larry R.: *See—*
Carter, Thurman B.; Reynolds, Carl D.; and Mundorf, Larry R., 4,618,009, Cl. 175-267.000.

Muraki, Hideaki: *See—*
Fujitani, Yoshiyasu; Muraki, Hideaki; Yokota, Koji; Sobukawa, Hideo; and Matsunaga, Shinichi, 4,617,794, Cl. 60-274.000.

Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; and Tomioka, Kenichi, to Yamanouchi Pharmaceutical Co., Ltd. Catechol derivatives and pharmaceutical compositions thereof for inhibiting anaphylaxis (SRS-A). 4,618,627, Cl. 514-678.000.

Murata Manufacturing Co., Ltd.: *See—*
Sakabe, Yukio; Karaki, Shintaro; and Nakano, Kiyoshi, 4,618,912, Cl. 361-309.000.

Murata, Shinji: *See—*
Yanagawa, Hitoshi; Nagasawa, Takeshi; Inoue, Shunzo; Iwaya, Toshio; and Murata, Shinji, 4,618,251, Cl. 355-28.000.

Murayama, Tetsuo: *See—*
Suzuki, Tetsumi; Murayama, Tetsuo; Ono, Hitoshi; Aramaki, Shinji; and Yokoyama, Michiyo, 4,618,555, Cl. 430-78.000.

Murch, Michael G.; and Melton, Geoffrey B., to Welding Institute, The. Shielded arc welding using auxiliary voltage. 4,618,760, Cl. 219-130.400.

Murphy, Patricia L.: *See—*
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; and Deal, James F., III, 4,618,348, Cl. 44-51.000.

Muscat, Peter P. Latching mechanism for convertible top. 4,618,180, Cl. 296-120.00A.

Musoo, Masanori: *See—*
Fukushima, Toshihiko; Miyamoto, Seigo; Fujita, Masahiko; Musoo, Masanori; and Sayo, Kosaku, 4,618,092, Cl. 236-92.00B.

Musschoot, Albert, to General Kinematics. Vibratory apparatus having variable lead angle and force. 4,617,832, Cl. 74-87.000.

Mussler, Karl J.: *See—*
White, Glenn S.; Mussler, Karl J.; and Van Exel, Gary A., 4,618,100, Cl. 239-440.000.

Muzslay, Steven Z., to ITT Corporation. Gender reversal connector. 4,618,196, Cl. 339-17.00C.

Myers, Harry K., Jr.: *See—*
Duggan, D. Michael; Lyons, James E.; and Myers, Harry K., Jr., 4,618,729, Cl. 568-678.000.

Myokan, Isao: *See—*
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,618,606, Cl. 514-202.000.

Naarden International N.V.: *See—*
Vos, Cornelis; and Brasser, Jan, 4,617,945, Cl. 131-310.000.

Naarmann, Herbert: *See—*
Muench, Volker; Hambrecht, Juergen; Naarmann, Herbert; Echte, Adolf; and Illers, Karl H., 4,618,636, Cl. 524-176.000.

Nabisco Brands, Inc.: *See—*
Johnson, Richard A.; Antrim, Richard L.; and Lloyd, Norman E., 4,618,584, Cl. 435-234.000.
Thulin, Robert R., 4,618,498, Cl. 426-275.000.

Nagahira, Jyoji: *See—*
Nagashima, Nao; Suzuki, Koji; Nagahira, Jyoji; Kuroda, Kouki; and Takayanagi, Yoshiaki, 4,618,246, Cl. 355-14.00R.

Nagai, Takashi: *See—*
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,618,606, Cl. 514-202.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Derailleur for a bicycle. 4,618,332, Cl. 474-80.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Derailleur for a bicycle. 4,618,333, Cl. 474-80.000.

Nagao, Tadasu; and Sayama, Shigeharu, to Kyushu Hitachi Maxell, Ltd. Electric spray. 4,618,099, Cl. 239-332.000.

Nagaoka, Takashi: *See—*
Miura, Haruo; Nagaoka, Takashi; Abe, Yoshiaki; and Sakata, Souji, 4,618,311, Cl. 415-149.00R.

Nagasaki, Tatsuo, to Olympus Optical Co., Ltd. Image pickup and observation equipment for endoscope. 4,618,884, Cl. 358-98.000.

Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, to Olympus Optical Co., Ltd. Electromagnetic noise preventive means for an endscope with solid state image pickup element. 4,618,885, Cl. 358-98.000.

Nagasawa, Takeshi: *See—*
Yanagawa, Hitoshi; Nagasawa, Takeshi; Inoue, Shunzo; Iwaya, Toshio; and Murata, Shinji, 4,618,251, Cl. 355-28.000.

Nagase, Hidenobu; and Umemoto, Atsushi, to Honda Giken Kogyo Kabushiki Kaisha. Piston for internal combustion engine. 4,617,887, Cl. 123-279.000.

Nagase, Masashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic microscope apparatus. 4,618,934, Cl. 364-507.000.

Nagashima, Nao; Suzuki, Koji; Nagahira, Jyoji; Kuroda, Kouki; and Takayanagi, Yoshiaki, to Canon Kabushiki Kaisha. Image forming device. 4,618,246, Cl. 355-14.00R.

Nagata, Tetsuya, to Seiko Seiki Kabushiki Kaisha. Table reciprocating apparatus. 4,617,760, Cl. 51-34.00C.

Nagy, Gabor: *See—*
Pal, Gabor; Endroczi, Gabor; Hollos, Gyorgy; Nagy, Gabor; Szonyi, Gabor; Bodi Laszlo ; and Balazs, Zoltan, 4,617,830, Cl. 73-590.000.

Nahas, Arthur G. Protective eyewear. 4,617,686, Cl. 2-433.000.

Nakabayashi, Akira: *See—*
Hanada, Sadashi; and Nakabayashi, Akira, 4,618,089, Cl. 228-212.000.

Nakada, Kaoru: *See—*
Ohashi, Tamaki; Suzuki, Tsunefusa; Nakada, Kaoru; Hoshi, Nobuya; Fujimura, Hisao; and Ui, Hiromitu, 4,617,831, Cl. 74-10.330.

Nakagawa, Masao, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for preparing α-methylstyrene-acrylonitrile copolymers. 4,618,663, Cl. 526-232.300.

Nakagawa, Yukio: *See—*
Sashiki, Takashi; and Nakagawa, Yukio, 4,618,011, Cl. 177-1.000.

Nakahara, Motohiro: *See—*
Suda, Hiroyuki; Shibata, Shuichi; and Nakahara, Motohiro, 4,618,354, Cl. 65-2.000.

Nakajima, Hideki, to Shimano Industrial Company Limited. Fishing reel. 4,618,107, Cl. 242-84.21R.

Nakajima, Tetsuo, to Honda Giken Kogyo Kabushiki Kaisha. Fuel injection control device for internal combustion engine. 4,617,899, Cl. 123-487.000.

Nakamura, Akihiro: *See—*
Ohashi, Masato; Kashioka, Motohiko; Tamura, Shinichi; Katsura, Hiromitsu; Ueda, Hideaki; and Nakamura, Akihiro, 4,618,554, Cl. 430-78.000.

Nakamura, Haruo, to Nissan Motor Co., Ltd.; and Kasai Kogyo Co., Ltd. Hinge structure for a sun visor or the like which features a single storage position snap action function. 4,617,699, Cl. 16-262.000.

Nakamura, Motoharu; Hirose, Kikuzi; and Sakamoto, Tooru, to Nippon Steel Corporation. Method for surface treatment of electrical steel sheet. 4,618,377, Cl. 148-6.15R.

Nakamura, Toshio: *See—*
Sasaki, Yutaka; Kiyomiya, Yutaka; and Nakamura, Toshio, 4,618,593, Cl. 502-20.000.

Nakamura, Yukio, to Sony Corporation. Electron beam deflection yoke. 4,618,843, Cl. 335-210.000.

Nakanishi, Nobuyasu; and Nomura, Yoshihisa, to Toyota Jidosha Kabushiki Kaisha. Vehicle hydraulic braking system with anti-skid pressure control means. 4,618,189, Cl. 303-116.000.

Nakano, Junji: *See—*
Yuyama, Yasuaki; Nakano, Junji; Kondo, Shyunichi; Sato, Hideo; and Sawada, Kenichi, 4,618,553, Cl. 430-69.000.

Nakano, Kiyoshi: *See—*
Sakabe, Yukio; Karaki, Shintaro; and Nakano, Kiyoshi, 4,618,912, Cl. 361-309.000.

Nakayama, Masatoshi: *See—*
Morita, Haruyuki; Yoshinari, Jiro; and Nakayama, Masatoshi, 4,618,542, Cl. 428-694.000.

Nakayama, Shigeki: *See—*
Ikeda, Akira; Nakayama, Shigeki; Ishii, Toshitsugu; and Itakura, Isao, 4,617,755, Cl. 47-65.000.

Nakazato, Norio: *See—*
Nawata, Makoto; Fukuyama, Ryoji; Nakazato, Norio; and Nishiumi, Masaharu, 4,618,398, Cl. 156-643.000.

Namekawa, Satoshi: *See—*
Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, 4,618,868, Cl. 346-75.000.

Nardella, Michael A.; and Cournoyer, Bernard T., to Barry Wright Corporation. Releasably locking. 4,618,118, Cl. 248-243.000.

Naruse, Nobutaka: *See—*
Sakai, Tadashi; and Naruse, Nobutaka, 4,617,806, Cl. 62-347.000.

Nastec, Inc.: *See—*
Anderson, William J., 4,617,838, Cl. 74-798.000.

Natali, Roberto: *See—*
Mattei, Riccardo; and Natali, Roberto, 4,617,782, Cl. 53-479.000.
National Research Development Corporation: *See—*
Dent, John C., 4,617,888, Cl. 123-307.000.
National Semiconductor Corporation: *See—*
Monticelli, Dennis M., 4,618,816, Cl. 323-316.000.
Russell, Ronald W., 4,618,833, Cl. 330-256.000.
Nawata, Makoto; Fukuyama, Ryoji; Nakazato, Norio; and Nishiumi, Masaharu, to Hitachi, Ltd. Dry etching method. 4,618,398, Cl. 156-643.000.
Nazemi, Said, to Laser Science, Inc. Gas laser with acoustic baffle. 4,618,960, Cl. 372-58.000.
NCR Canada Ltd: *See—*
Therrien, Roger H.; and Chahal, Maninderpal S., 4,618,254, Cl. 355-68.000.
NDM Corporation: *See—*
Cartmell, James V.; Allaire, Michael J.; and Wolf, Michael L., 4,617,935, Cl. 128-641.000.
Neal, Joseph H.: *See—*
Tran, Bao G.; Neal, Joseph H.; and White, Lionel S., 4,618,947, Cl. 365-230.000.
Neale, Michael W.: *See—*
Vance, Ian A. W.; and Neale, Michael W., 4,618,967, Cl. 375-80.000.
Nealon, James T.: *See—*
Bratt, Richard G.; Gruner, Ronald H.; Jones, Thomas M.; and Nealon, James T., 4,618,925, Cl. 364-200.000.
Neatherlin, Robert L.: *See—*
Peel, Harry H.; Brisco, John S.; Moczygemba, Mark E.; Neatherlin, Robert L.; and Sargent, Brenda A., 4,617,937, Cl. 128-680.000.
NEC Corporation: *See—*
Kondo, Michikazu, 4,618,210, Cl. 350-96.140.
Kouyama, Toshitake; and Katsube, Ryoji, 4,618,890, Cl. 358-149.000.
Mito, Ikuo, 4,618,959, Cl. 372-46.000.
Mori, Toshihiro, 4,618,860, Cl. 340-825.440.
Tomimitsu, Yasuharu, 4,618,942, Cl. 364-900.000.
Neeb, Rudolf; Ironich, Wolfgang; and Volk, Heinrich, to Hoechst Aktiengesellschaft. Process for preparing 6-acetoxy-2-naphthoic-acid and pure 6-hydroxy-2-naphthoic acid. 4,618,701, Cl. 560-139.000.
Nelson, Maynard A.; and Gloger, Kelly C., to GN Alternatives. Bed frame and releasable coupling employed therein. 4,617,689, Cl. 5-400.000.
Nelson, Robert T. Dust collector. 4,618,352, Cl. 55-287.000.
Nelson, Thomas A.: *See—*
Seidel, William E.; Markunas, Albert L.; and Nelson, Thomas A., 4,617,958, Cl. 137-492.500.
Nestlen, Wolfgang; and Schmitt, Gerd. Miniature relay. 4,618,842, Cl. 335-128.000.
Nevitt, Thomas D.: *See—*
Tait, A. Martin; Nevitt, Thomas D.; and Hensley, Albert L., Jr., 4,618,594, Cl. 502-66.000.
Nichols, Albert D.; and Nichols, Raymond C. Meat product press apparatus. 4,617,859, Cl. 99-351.000.
Nichols, Raymond C.: *See—*
Nichols, Albert D.; and Nichols, Raymond C., 4,617,859, Cl. 99-351.000.
Nicholson, Robert D., to Bardle Servovalve Co. Electromagnetic positioner for a servovalve or the like. 4,617,966, Cl. 137-625.620.
Niedermaier, Arnold; and Maier, Peter, to Albert-Frankenthal AG. Cylinder with internal heat exchange coils to handle continuous webs. 4,617,864, Cl. 101-219.000.
Niekamp, Carl W.: *See—*
Dwiggins, Bruce L.; Pickens, Carl E.; and Niekamp, Carl W., 4,618,579, Cl. 435-96.000.
Niemeyer, Ulf: *See—*
Scheffler, Gerhard; Niemeyer, Ulf; Brock, Norbert; and Pohl, Jorg, 4,618,692, Cl. 558-81.000.
Niermann, Hans: *See—*
Kohnen, Klaus; Niermann, Hans; and Ullrich, Norbert, 4,617,988, Cl. 165-95.000.
Nieuweboer, Bob: *See—*
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Mannesmann, Gerda; Nieuweboer, Bob; and Town, Michael-Harold, 4,618,626, Cl. 514-530.000.
Nifco Inc.: *See—*
Omata, Nobuaki, 4,618,039, Cl. 192-4.00B.
Sasaki, Michiaki; and Mizusawa, Akira, 4,618,422, Cl. 210-172.000.
Nihon Technical Kabushiki Kaisha: *See—*
Ohashi, Tamaki; Suzuki, Tsunefusa; Nakada, Kaoru; Hoshi, Nobuya; Fujimura, Hisao; and Ui, Hiromitu, 4,617,831, Cl. 74-10.330.
Nikkei Kako Kabushiki Kaisha: *See—*
Suzuki, Nobuyuki; Tanaka, Kenichi; and Yamanashi, Masanao, 4,617,979, Cl. 164-97.000.
Nikko Kogyo Kabushiki Kaisha: *See—*
Igarashi, Osamu, 4,618,208, Cl. 339-200.00P.
Nilsen, Stein-Arne: *See—*
Fonne, Gunnar J.; Daae-Johansen, Finn; Thoresen, Per; and Nilsen, Stein-Arne, 4,617,777, Cl. 52-802.000.
Nilsson, Lennart S.: *See—*
Cooper, Glenn D.; Butler, John M., III; Morrison, Darrell R.; Senic, Charles L.; Nilsson, Lennart S.; and Rowe, Charles M., 4,618,795, Cl. 310-260.000.
Nilsson, Ove K. G. Sandwich electrode and a battery comprising the same. 4,618,549, Cl. 429-234.000.
Nilsson, Rolf, to Volvo BM AB. Annular reinforced wiper for piston rods. 4,618,153, Cl. 277-152.000.
Nippon Colin: *See—*
Peel, Harry H.; Brisco, John S.; Moczygemba, Mark E.; Neatherlin, Robert L.; and Sargent, Brenda A., 4,617,937, Cl. 128-680.000.
Nippon Light Metal Company Limited: *See—*
Suzuki, Nobuyuki; Tanaka, Kenichi; and Yamanashi, Masanao, 4,617,979, Cl. 164-97.000.
Nippon Notion Kogyo Co., Ltd.: *See—*
Kasai, Kazumi, 4,617,704, Cl. 24-236.000.
Taga, Yukio, 4,618,053, Cl. 198-389.000.
Nippon Oil Company: *See—*
Uemura, Seiichi; Hirose, Takao; Shohda, Yoshio; Sakamoto, Takayoshi; and Katoh, Kenji, 4,618,463, Cl. 264-29.200.
Nippon Petrochemicals Company, Limited: *See—*
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,618,914, Cl. 361-315.000.
Nippon Piston Ring Co., Ltd.: *See—*
Matsuzaki, Michiyoshi, 4,618,317, Cl. 418-63.000.
Nippon Seiki Co., Ltd.: *See—*
Yokoyama, Meiso; Takahashi, Makoto; Nishiwaki, Tsunehiko; and Imai, Makoto, 4,617,821, Cl. 73-23.000.
Nippon Soken, Inc.: *See—*
Kondo, Yasuo; Watanabe, Masakane; and Oshiro, Takao, 4,618,096, Cl. 239-101.000.
Sakakibara, Hiroyuki; Akita, Shigeyuki; Kodera, Masao; and Maeno, Tsuyoshi, 4,618,948, Cl. 367-104.000.
Nippon Steel Corporation: *See—*
Nakamura, Motoharu; Hirose, Kikuzi; and Sakamoto, Tooru, 4,618,377, Cl. 148-6.15R.
Nippon Telecommunication Engineering Company: *See—*
Asano, Kiyomitsu; and Kondo, Toshikatsu, 4,618,277, Cl. 400-124.000.
Nippon Telegraph & Telephone Corporation: *See—*
Egami, Shunichiro; and Kawai, Makoto, 4,618,831, Cl. 330-124.00R.
Nippon Telegraph & Telephone Public Corporation: *See—*
Hatakeyama, Iwao; Maeda, Yasushi; Ishii, Osamu; and Yoshii, Shizuka, 4,618,901, Cl. 360-114.000.
Suda, Hiroyuki; Shibata, Shuichi; and Nakahara, Motohiro, 4,618,354, Cl. 65-2.000.
Nippondenso Co., Ltd.: *See—*
Kato, Hideaki; and Oohashi, Kaoru, 4,618,156, Cl. 280-6.00R.
Kondo, Yasuo; Watanabe, Masakane; and Oshiro, Takao, 4,618,096, Cl. 239-101.000.
Sakakibara, Koji; Haraguchi, Hiroshi; and Yukumoto, Hideki, 4,617,895, Cl. 123-425.000.
Yamada, Yutaka, 4,617,959, Cl. 137-512.100.
Nishida, Yoshikazu; and Hashimoto, Isamu, to Matsushita Electric Industrial Co., Ltd. Electrically-operated driver. 4,617,843, Cl. 81-57.110.
Nishide, Kazuhiro: *See—*
Yamano, Shoji; Mikata, Yoshitaka; Teramoto, Osamu; and Nishide, Kazuhiro, 4,618,012, Cl. 177-25.000.
Yamano, Shoji; Mikata, Yoshitaka; Teramoto, Osamu; and Nishide, Kazuhiro, 4,618,013, Cl. 177-25.000.
Nishihara, Toshio: *See—*
Yamamoto, Hideomi; Watanabe, Haruzo; Kishie, Hidehiko; and Nishihara, Toshio, 4,617,717, Cl. 29-527.400.
Nishikawa, Hiromitsu: *See—*
Kagiyama, Tsutomu; Kobayashi, Fumio; Yamagishi, Jun; and Nishikawa, Hiromitsu, 4,617,757, Cl. 49-280.000.
Nishikawa, Masao; Sakai, Sninzo; and Miyake, Junichi, to Honda Giken Kogyo Kabushiki Kaisha. Control device for direct clutch in automatic transmission. 4,618,037, Cl. 192-3.300.
Nishikawa, Toshihiro: *See—*
Okamura, Hisashi; Kobayashi, Hidetoshi; Nishikawa, Toshihiro; and Tamoto, Koji, 4,618,573, Cl. 430-558.000.
Nishimatsu, Masaharu; Ide, Toshiaki; Arioka, Hiroyuki; and Kubota, Yuichi, to TDK Corporation. Magnetic recording medium. 4,618,535, Cl. 428-325.000.
Nishimiya, Torazo; Ito, Tomoo; and Iseyama, Takashi, to Hitachi, Ltd. Idle speed control device. 4,617,889, Cl. 123-339.000.
Nishimura, Takumi; and Saito, Tadao, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Hydraulic anti-skid apparatus for automotive vehicles. 4,618,188, Cl. 303-116.000.
Nishimura, Yukuo: *See—*
Munakata, Hirohide; Tomida, Yoshinori; Haruta, Masahiro; Hirai, Yutaka; Nishimura, Yukuo; and Hamamoto, Takashi, 4,618,561, Cl. 430-156.000.
Nishioka, Yoshiki; Hakaridani, Mitsuhiro; and Iwahashi, Hiroyuki, to Sharp Kabushiki Kaisha. Speech recognition with preliminary matching. 4,618,983, Cl. 381-43.000.
Nishiumi, Masaharu: *See—*
Nawata, Makoto; Fukuyama, Ryoji; Nakazato, Norio; and Nishiumi, Masaharu, 4,618,398, Cl. 156-643.000.
Nishiwaki, Tsunehiko: *See—*
Yokoyama, Meiso; Takahashi, Makoto; Nishiwaki, Tsunehiko; and Imai, Makoto, 4,617,821, Cl. 73-23.000.
Nissan Motor Co., Ltd.: *See—*
Ideta, Yasufumi, 4,618,036, Cl. 192-3.300.
Nakamura, Haruo, 4,617,699, Cl. 16-262.000.
Sasaki, Michiaki; and Mizusawa, Akira, 4,618,422, Cl. 210-172.000.
Sugano, Kazuhiko, 4,617,841, Cl. 74-869.000.
Yamanouchi, Katsuto; Saitoh, Katsuo; Saito, Yoshinori; and Kikyohara, Tadashi, 4,618,417, Cl. 210-149.000.

Nissan Shatai Company, Limited: *See*—
Kobayashi, Shinma; and Kajita, Shunsuke, 4,617,986, Cl. 165-42.000.

Nisshin Kogyo Kabushiki Kaisha: *See*—
Hachiro, Nobuaki, 4,617,858, Cl. 92-98.00D.

Nitto Chemical Industry Co., Ltd.: *See*—
Sasaki, Yutaka; Kiyomiya, Yutaka; and Nakamura, Toshio, 4,618,593, Cl. 502-20.000.

Nitto Electric Industrial Co., Ltd.: *See*—
Iwama, Akio; Tasaka, Kentaro; and Kazuse, Yoshitaka, 4,618,534, Cl. 428-316.600.

Noda, Azusa; and Kamiya, Tadashi, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 4,618,020, Cl. 180-229.000.

Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel with friction and magnetic brakes. 4,618,106, Cl. 242-84.50R.

Noguchi, Matsusaburo; Yamamoto, Mikio; and Kojima, Tetsuji, to Oki Electric Industry Co., Ltd. Photosensitive drum cleaning device in electrophotographic recording system. 4,618,250, Cl. 355-15.000.

Nohara, Kazunori; Tanmatsu, Katsuo; Hosoya, Nobukazu; and Higashino, Takeshi, to Sanyo Electric Co., Ltd. Scrambling system of television signal. 4,618,888, Cl. 358-120.000.

Noll, Robert S.: *See*—
Bond, Michael E.; and Noll, Robert S., 4,617,692, Cl. 7-158.000.

Nomura, Kanji: *See*—
Kimura, Kyoichi; Nomura, Kanji; Ubukata, Kazumi; and Kasahara, Shinju, 4,618,132, Cl. 296-97.00J.

Nomura, Yoshihisa: *See*—
Nakanishi, Nobuyasu; and Nomura, Yoshihisa, 4,618,189, Cl. 303-116.000.

Noordermeer, Jacobus W. M.: *See*—
Lohmeijer, Johannes H. G. M.; Noordermeer, Jacobus W. M.; and Bussink, Jan, 4,618,637, Cl. 524-192.000.

Nord, Philip J. Centri-lever orthodontic appliance. 4,618,324, Cl. 433-19.000.

Norlin, Stig I., to Saab-Scania Aktiebolag. Arrangement in a vehicle with a drive unit mounted in a subframe. 4,618,023, Cl. 180-312.000.

Norquest, Robert C.: *See*—
Ingersoll, Willard A.; Norquest, Robert C.; and Weber, Richard A., 4,617,781, Cl. 53-477.000.

North American Philips Consumer Electronics Corp.: *See*—
Donofrio, Robert L.; and Puhak, Peter G., 4,618,206, Cl. 339-144.00T.

North American Philips Corporation: *See*—
Malko, John A., 4,617,936, Cl. 128-653.000.
Strange, Thomas F.; and Carino, John W., 4,618,910, Cl. 361-275.000.

Northrop Corporation: *See*—
Eisenberg, Philip H., 4,618,222, Cl. 350-582.000.
Kawaguchi, Frank M., 4,618,892, Cl. 358-163.000.
Smith, Eugene A., 4,618,224, Cl. 350-618.000.

Noske, Erich: *See*—
Grassme, Ulrich; and Noske, Erich, 4,618,974, Cl. 378-40.000.

Novavis Intercontinental, Ltd.: *See*—
Colmelet, Giorgio, 4,618,670, Cl. 530-378.000.

Nowlin, Thomas E., to Mobil Oil Corporation. Catalyst composition for polymerizing alpha-olefins. 4,618,662, Cl. 526-129.000.

Nozaki, Hitosi; and Oshima, Koichiro, to Du Pont de Nemours, E. I., and Company. Perfluorocarbon polymer oxidation catalyst and preparation of carbonyl compound. 4,618,724, Cl. 568-311.000.

NRM Corporation: *See*—
Singh, Anand P., 4,618,320, Cl. 425-38.000.

Nygren, Jan; and Hilmersson, Anders, to Tetra Pak International AB. Method and an arrangement for the manufacture of packing containers. 4,617,779, Cl. 53-433.000.

Nytomt, Jan G.: *See*—
Johansson, Sven H.; and Nytomt, Jan G., 4,617,907, Cl. 123-647.000.

Obe-Werk Ohnmacht & Baumgartner GmbH & Co. K.G.: *See*—
Drlik, Gunther, 4,617,698, Cl. 16-228.000.

Oda, Robert: *See*—
Hurd, Bruce; and Oda, Robert, 4,618,147, Cl. 273-54.00B.

Odahara, Tetsuichi: *See*—
Eguchi, Jutaro; Odahara, Tetsuichi; and Sukenari, Junzo, 4,617,787, Cl. 56-14.600.

O'Donnell, Joe: *See*—
Weiler, Robert M., 4,617,765, Cl. 51-205.0WG.

Ofstead, Ronald F., to Minnesota Mining and Manufacturing Company. Copolymers of poly(vinyl trifluoroacetate) or poly(vinyl alcohol). 4,618,649, Cl. 525-60.000.

Ogasawara, Tsunehiko; Arakawa, Yoshichika; Sumiya, Koji; and Sakaguchi, Yoshikazu, to Aisin Seiki Kabushiki Kaisha; and Aisin Warner Kabushiki Kaisha. Control apparatus of an automatic transmission with a lock-up clutch. 4,618,038, Cl. 192-3.290.

Ogawa, Takahiro; Takada, Masahiko; Matsumoto, Takaharu; and Kanbara, Youichi, to Kanegafuchi Kaguku Kogyo Kabushiki Kaisha. Flame-retardant acrylic fibers and process for preparing same. 4,618,469, Cl. 264-182.000.

Ohashi, Masato; Kashioka, Motohiko; Tamura, Shinichi; Katsura, Hiromitsu; Ueda, Hideaki; and Nakamura, Akihiro, to Toyo Ink Mfg. Co., Ltd.; and Minolta Camera Kabushiki Kaisha. Electrophotographic photoreceptor having photosensitive layer made of a phthalocyanine treated with an acrylic resin. 4,618,554, Cl. 430-78.000.

Ohashi, Tamaki; Suzuki, Tsunefusa; Nakada, Kaoru; Hoshi, Nobuya; Fujimura, Hisao; and Ui, Hiromitu, to Nihon Technical Kabushiki Kaisha. Push button type tuner. 4,617,831, Cl. 74-10.330.

Ohe, Junya; Wakita, Saburo; Yamatsuta, Kiichi; Goto, Shoji; Kutsukake, Yukinori; and Sugizaki, Masuo, to Asahi Fiber Glass Company, Limited; Asahi Glass Company, Limited; and Mitsubishi Kinzoku Kabushiki Kaisha. Co-base heat resistant alloy. 4,618,474, Cl. 420-436.000.

Ohi Seisakusho Co., Ltd.: *See*—
Kagiyama, Tsutomu; Kobayashi, Fumio; Yamagishi, Jun; and Nishikawa, Hiromitsu, 4,617,757, Cl. 49-280.000.

Ohishi, Hiroyuki: *See*—
Saito, Toranosuke; Kitani, Masakatu; and Ohishi, Hiroyuki, 4,618,693, Cl. 558-82.000.

Ohnishi, Yasuhiko, to Kamiya, Sadayoshi, a part interest. Pullulan copolymer. 4,618,664, Cl. 527-300.000.

Ohshima, Toshio: *See*—
Yokoyama, Naoki; and Ohshima, Toshio, 4,617,724, Cl. 29-576.00B.

Ohtaka, Keiji: *See*—
Akashi, Akira; Ishizaki, Akira; Hiramatsu, Akira; Suda, Yasuo; and Ohtaka, Keiji, 4,618,236, Cl. 354-406.000.

Oishi, Kengo; and Suzuki, Masaaki, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,618,903, Cl. 360-132.000.

Okajima, Yoshinori, to Fujitsu Limited. Semiconductor memory having word line discharge current controller. 4,618,944, Cl. 365-189.000.

Okamura, Hisashi; Kobayashi, Hidetoshi; Nishikawa, Toshihiro; and Tamoto, Koji, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,618,573, Cl. 430-558.000.

Okamura, Kiyohito; Hasegawa, Yoshio; Kuroo, Yoshiyasu; and Ugaji, Masana, to Sony Corporation; and Foundation: The Research Institute for Special Inorganic Materials, The. Silicon carbide-carbon composite molded product and process for manufacturing the same. 4,618,591, Cl. 501-90.000.

Okawa, Susumu; and Jufuku, Yasunobu, to Toyota Jidosha Kabushiki Kaisha. V-belt assembly for transmitting power. 4,618,337, Cl. 474-201.000.

Okazaki, Sumio: *See*—
Isobe, Masahiro; Okazaki, Sumio; and Tanaka, Hideki, 4,618,336, Cl. 474-133.000.

Oki Electric Industry Co., Ltd.: *See*—
Noguchi, Matsusaburo; Yamamoto, Mikio; and Kojima, Tetsuji, 4,618,250, Cl. 355-15.000.

Okimoto, Haruo: *See*—
Todokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, 4,617,799, Cl. 60-602.000.

Okino, Susumu: *See*—
Shinoda, Naoharu; Tatani, Atsushi; Omoto, Setsuo; Okino, Susumu; and Shimizu, Taku, 4,618,482, Cl. 423-242.000.

Okita, Masao; and Sakai, Satoshi, to Alps Electric Co., Ltd. Disc clamp device. 4,618,951, Cl. 369-270.000.

Okubo, Kunihiko, to Shimadzu Corporation. Slit changing device for monochromator. 4,618,260, Cl. 356-331.000.

Okuda, Hiromichi; Masuno, Hiroshi; Aburada, Masaki; Takeda, Shigefumi; Itoh, Eiko; Matsushita, Moe; and Hosoya, Eikichi, to Tsumura Juntendo Inc. Preparation for reducing cancer symptoms without treating cancer. 4,618,495, Cl. 424-195.100.

Okumura, Kazuo: *See*—
Teraji, Tsutomu; Shiokawa, Youichi; Okumura, Kazuo; and Sato, Yoshinari, 4,618,610, Cl. 514-242.000.

Okuyama, Takahiro; Toki, Susumu; and Ishihara, Masahito, to Honda Giken Kogyo Kabushiki Kaisha; and Tokai TRW & Co., Ltd. Pivot members for a cam follower of valve mechanism for internal combustion engine. 4,617,883, Cl. 123-90.440.

Oldham, Steve A.; and Picotte, Ronald T., to Champion International Corporation. Tube positioning and transfer system. 4,618,341, Cl. 493-14.000.

Olin Corporation: *See*—
Fair, David L.; Justice, David D.; and Kelly, Pilar P., 4,618,403, Cl. 204-98.000.

Oliver Industries, Inc.: *See*—
Bell, James C., 4,618,082, Cl. 224-321.000.

Ollendick, Gary B.: *See*—
Jacksier, Barry H.; and Ollendick, Gary B., 4,618,787, Cl. 307-591.000.

Olsen, Edward H.: *See*—
Harding, Robert C.; and Olsen, Edward H., 4,618,855, Cl. 340-605.000.

Olson, Robert E.: *See*—
LeVahn, Bruce A.; and Olson, Robert E., 4,617,916, Cl. 128-20.000.

Olson, Thor, to Molex Incorporated. Process of manufacturing a flexible substrate assembly. 4,617,733, Cl. 29-874.000.

Olson, Wayne L., to Rose Manufacturing Company. Apparatus and method for producing a counteracting force. 4,618,026, Cl. 182-4.000.

Olsson, Frank C.: *See*—
Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, 4,618,067, Cl. 220-1.500.

Oltmann, Harold D.: *See*—
Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; Oltmann, Harold D.; and Chen, Shu P., 4,618,528, Cl. 428-216.000.

Olympia Werke AG: *See*—
Brinkmann, Gerhard; and Wietrzynski, Bolko, 4,618,275, Cl. 400-76.000.

Olympus Optical Co., Ltd.: *See*—
Ikari, Kazuo; and Fujii, Toru, 4,618,234, Cl. 354-225.000.
Maitani, Yoshihisa; Tsunefuji, Katsuhiko; and Yamasaki, Masafumi, 4,618,238, Cl. 354-431.000.
Nagasaki, Tatsuo, 4,618,884, Cl. 358-98.000.
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,618,885, Cl. 358-98.000.

Olympus Optical Co., Ltd: *See*—
Kitagawa, Masahiro, 4,618,237, Cl. 354-412 000.

Omata, Nobuaki, to Nifco Inc. One-way clutch. 4,618,039, Cl. 192-4.00B.

Omega Castings, Inc.: *See*—
Cutshall, Robert S., 4,618,056, Cl. 198-853.000.

Omori, Kenji: *See*—
Hashizume, Kazuko; Kase, Hiroshi; Kitamura, Shigeto; Iida, Takao; Shirahata, Kunikatsu; Omori, Kenji; and Shuto, Katsuichi, 4,618,613, Cl. 514-312.000.

Omoto, Setsuo: *See*—
Shinoda, Naoharu; Tatani, Atsushi; Omoto, Setsuo; Okino, Susumu; and Shimizu, Taku, 4,618,482, Cl. 423-242.000.

Omura, Takashi: *See*—
Kayane, Yutaka; Miyamoto, Tetsuya; Omura, Takashi; Sawamoto, Hirokazu; Harada, Naoki; and Takeshita, Akira, 4,618,671, Cl. 534-635.000.

Ono, Hitoshi: *See*—
Suzuki, Tetsumi; Murayama, Tetsuo; Ono, Hitoshi; Aramaki, Shinji; and Yokoyama, Michiyo, 4,618,555, Cl. 430-78.000.

Ono, Mitsunori; Itoh, Isamu; and Mihayashi, Keiji, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material. 4,618,563, Cl. 430-219.000.

Ono, Takatoshi: *See*—
Sekiya, Shinji; and Ono, Takatoshi, 4,617,766, Cl. 51-209.00R.

Ono, Yoshiaki: *See*—
Kawaguchi, Katsuhiko; and Ono, Yoshiaki, 4,618,134, Cl. 271-4.000.

Onodera, Kaoru: *See*—
Kadowaki, Takashi; and Onodera, Kaoru, 4,618,570, Cl. 430-505.000.

Oohashi, Kaoru: *See*—
Kato, Hideaki; and Oohashi, Kaoru, 4,618,156, Cl. 280-6.00R.

Orimoto, Takashi: *See*—
Yoshida, Junichi; and Orimoto, Takashi, 4,618,146, Cl. 273-1.00E.

Oronzio de Nora Impianti Elettrochimici S.p.A.: *See*—
Pellegri, Alberto, 4,618,404, Cl. 204-128.000.

Orszagos Husipari Kutatointezet: *See*—
Batorfalvi, Geza; Lendvai, Tibor; Radai, Antal; Pongrac, Gaborne ; Szabo, Miklos; and Szilardi, Jeno , 4,617,700, Cl. 17-45.000.

Osaka Kongo Seito Co., Ltd.: *See*—
Hashimoto, Masahiro; and Tani, Hideo, 4,618,349, Cl. 51-298.000.

Osborn, Claiborn L.; Koleske, Joseph V.; and Drake, Kenneth, to Union Carbide Corporation. Coating compositions prepared from lactone-acrylate adduct, polyol and isocyanate. 4,618,635, Cl. 524-113.000.

Oshima, Koichiro: *See*—
Nozaki, Hitosi; and Oshima, Koichiro, 4,618,724, Cl. 568-311.000.

Oshiro, Nobuaki; and Futakuchi, Yorio, to Yamaha Hatsudoki Kabushiki Kaisha. Balancer device for internal combustion engines. 4,617,885, Cl. 123-192.00B.

Oshiro, Takao: *See*—
Kondo, Yasuo; Watanabe, Masakane; and Oshiro, Takao, 4,618,096, Cl. 239-101.000.

Oskarsson, Rolf G.: *See*—
von Holst, Johan P.; and Oskarsson, Rolf G., 4,618,540, Cl. 428-552.000.

Oster, Clark L.: *See*—
Wehr, Eugene W.; Oster, Clark L.; and Evans, Terence J., 4,618,751, Cl. 200-144.00R.

Ostlund, Artur: *See*—
Larsson, Hans G.; Westman, Erik; and Ostlund, Artur, 4,618,964, Cl. 373-155.000.

Otobe, Yutaka; and Yamato, Akihiro, to Honda Giken Kogyo K.K. Air-fuel ratio feedback coutrol method for internal combustion engines. 4,617,901, Cl. 123-489.000.

Otobe, Yutaka; and Kiuchi, Takeo, to Honda Giken Kogyo Kabushiki Kaisha. Method of detecting abnormality in input and output units. 4,618,954, Cl. 371-16.000.

Otto, Jack F.; and Colacello, Michael A., to RCA Corporation. Method and apparatus for sealing a mount in a cathode ray tube. 4,618,355, Cl. 65-36.000.

Overfield, Robert E., to Exxon Research and Engineering Company. Method for extracting nickel and vanadium compounds from oils. 4,618,413, Cl. 208-251.00R.

Overvaag, Duane B.: *See*—
Meis, Charles H.; and Overvaag, Duane B., 4,618,102, Cl. 239-737.000.

Owen, Robert B.: *See*—
Keller, Vernon W.; Owen, Robert B.; Elkins, Bobby R.; and White, William T., 4,618,215, Cl. 350-319.000.

Oxide & Chemical Corporation: *See*—
McKinney, Benjamin F., 4,618,478, Cl. 422-198.000.

OY Tampella AB: *See*—
Koistinen, Pauli A. T.; and Hamalainen, Risto J., 4,617,715, Cl. 29-456.000.

Ozaki, Yukio; Fujisawa, Osamu; Sakai, Ryukichi; and Hasegawa, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Gas-insulated interrupter. 4,618,752, Cl. 200-148.00R.

Ozawa, Hirotaka: *See*—
Kori, Takuaki; Ozawa, Hirotaka; and Sugawara, Shiro, 4,617,714, Cl. 29-434.000.

Ozawa, Yoichi; Kishimoto, Shinichi; Shinohara, Emiko; Takemoto, Tadashi; and Eguchi, Chikahiko, to Ajinomoto Co., Inc. Method of preparing methyl ester and its hydrochloride. 4,618,695, Cl. 560-41.000.

P.L.G. Research Limited: *See*—
Mercer, Frank B., 4,618,385, Cl. 156-229.000.

Padberg, Werner: *See*—
Hartan, Hans-Georg; Padberg, Werner; and Muller, Dietrich, 4,618,414, Cl. 209-5.000.

Padovani, Pietro, to I.S.A.P. Spa (Industrie Specializzate Articoli Plastici). Label for egg trays and the like. 4,617,748, Cl. 40-312.000.

Padrun, John. Extensible reinforcing bar assembly and clip. 4,617,775, Cl. 52-684.000.

Paduchowski, James S.: *See*—
Hindman, David B.; Paduchowski, James S.; and Lima, Joseph D., 4,618,431, Cl. 210-741.000.

Pagdin, Brian C., to Solex (U.K.) Limited. Air/fuel induction system for a multi-cylinder internal combustion engine. 4,617,904, Cl. 123-525.000.

Pages, Jean F.: *See*—
Michel, Dominique; Johnson, Delbert B.; Pages, Jean F.; Foglia, Vincent F. P.; Martin, Jean G. M.; Vache , Michel P.; Sedillot, Francois G.; and Crull, Carroll M., 4,618,286, Cl. 405-208.000.

Pai, Damodar M.: *See*—
Stolka, Milan; Pai, Damodar M.; Smith, Thomas W.; Duff, James M.; and Loutfy, Rafik O., 4,618,551, Cl. 430-58.000.

Paice, Derek A.; and Mattern, Kenneth E., to Westinghouse Electric Corp. Hybrid solid state/mechanical switch with failure protection. 4,618,906, Cl. 361-5.000.

Pal, Gabor; Endroczi, Gabor; Hollos, Gyorgy; Nagy, Gabor; Szonyi, Gabor; Bodi Laszlo ; and Balazs, Zoltan. Method and apparatus for checking heterogeneous transformation process of diffusing kinetics in turbulent liquid flow. 4,617,830, Cl. 73-590.000.

Palfery, Kenneth J.; Puckering, Donald R.; Kocev, Angel; and Maharaj, Kenrick B., to McDonnell Douglas Corporation. Automated machine tool having a rotary indexing fixture. 4,617,720, Cl. 29-568.000.

Palguta, Stephen E.: *See*—
Lay, Khin M.; Palguta, Stephen E.; Fernandez, Ramon B.; and Cabalquinto, Santiago C., 4,617,716, Cl. 29-526.00R.

Palmer, Charles R., to Rolls-Royce plc. Thrust deflection. 4,618,094, Cl. 239-265.370.

Palmquist, Ronald W., to Corning Glass Works. Furnace bottom heating. 4,618,962, Cl. 373-30.000.

Palosi, Eva: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,618,611, Cl. 514-255.000.

Pantasote Inc.: *See*—
Pasqualini, Bruno; and Merla, Adriano, 4,617,759, Cl. 49-487.000.

Papst, Georg; and Wrobel, Gunter, to Papst-Motoren GmbH & Co. Small fan. 4,618,315, Cl. 417-354.000.

Papst-Motoren GmbH & Co.: *See*—
Papst, Georg; and Wrobel, Gunter, 4,618,315, Cl. 417-354.000.

Paquet, Andre J., to Engetra S.A. Process and device for recovery of thermal energy in a steam generating system. 4,617,878, Cl. 122-422.000.

Parfitt, Steven P., to Texas Instruments Incorporated. Analog to digital converter circuit. 4,618,848, Cl. 340-347.0CC.

Paris, Jean-Marc: *See*—
Corbet, Jean-Pierre; Cotrel, Claude; Farge, Daniel; and Paris, Jean-Marc, 4,618,599, Cl. 514-11.000.

Parker, John A.; Heimbuch, Alvin H.; Hsu, Ming-ta S.; and Chen, Timothy S., to United States of America, National Aeronautics and Space Administration. Process for curing bismaleimide resins. 4,618,652, Cl. 525-282.000.

Parkinson, Brian. Oyster opener. 4,617,734, Cl. 30-120.100.

Parks, Jimmy C., to Smith International, Inc. Method and apparatus for forming a thread profile impression. 4,618,465, Cl. 264-40.100.

Parliment, Thomas H., to General Foods Corporation. Flavoring with α, β-keto-imines. 4,618,501, Cl. 426-534.000.

Parnell, Edgar W.: *See*—
Cramp, Michael C.; Gilmour, James; and Parnell, Edgar W., 4,618,366, Cl. 71-94.000.

Parnham, Michael: *See*—
Dereu, Norbert; Welter, Andre ; Wendel, Albrecht; Leyck, Sigurd; Parnham, Michael; Graf, Erich; Sies, Helmut; Betzing, Hans; and Fischer, Hartmut, 4,618,669, Cl. 530-331.000.

Pasqualini, Bruno; and Merla, Adriano, to Pantasote Inc. Profile of plastic material for refrigerator cabinets. 4,617,759, Cl. 49-487.000.

Patil, Arvind S.; and Pepoy, Louis J., to BASF Corporation. Transparent iron oxide pigments. 4,618,375, Cl. 106-304.000.

Paul, Klaus-Dieter: *See*—
Wiessner, Edgar; Harbauer, Werner; and Paul, Klaus-Dieter, 4,618,807, Cl. 318-280.000.

Pauley, Gregory L.; and Zahn, Wayne V., to Pauley, Gregory L. Spinner bait component system. 4,617,753, Cl. 43-42.190.

Pawelek, John M., to Yale University. Composition and method for treatment of melanomas. 4,618,484, Cl. 424-1.100.

Payraudeau, Henri-Andre , to MORS. Device for locking and releasing objects intended for public use, such as luggage carts. 4,618,050, Cl. 194-212.000.

Peel, Harry H.; Brisco, John S.; Moczygemba, Mark E.; Neatherlin, Robert L.; and Sargent, Brenda A., to Nippon Colin. Blood pressure monitoring system. 4,617,937, Cl. 128-680.000.

Peiretti, Domenico: *See*—
Gilli, Luigi; and Peiretti, Domenico, 4,618,758, Cl. 219-121.0LG.

Pekar, Howard G.: *See*—
Kinkelaar, Edmund W.; and Pekar, Howard G., 4,618,513, Cl. 427-443.100.

Pellegri, Alberto, to Oronzio de Nora Impianti Elettrochimici S.p.A. Electrode for electrochemical processes, method for preparing the same and use thereof in electrolysis cells. 4,618,404, Cl. 204-128.000.

Pennwalt Corporation: *See—*
Toukan, Sameeh S.; and King, James P., 4,618,438, Cl. 252-47.500.

Pepoy, Louis J.: *See—*
Patil, Arvind S.; and Pepoy, Louis J., 4,618,375, Cl. 106-304.000.

Perkin-Elmer Corporation, The: *See—*
Schwartz, Arnold, 4,618,935, Cl. 364-510.000.

Perobelli, Aldo: *See—*
Pessina, Giorgio; and Perobelli, Aldo, 4,618,136, Cl. 271-150.000.

Perron, Robert: *See—*
Gauthier-Lafaye, Jean; and Perron, Robert, 4,618,460, Cl. 260-549.000.

Perros Industriale S.p.A.: *See—*
Claisen, Silvano, 4,618,321, Cl. 425-88.000.

Persyk, Dennis E.; and Stoub, Everett W., to Siemens Gammasonics, Inc. Radiation detector circuit with real time photon counting. 4,618,775, Cl. 250-369.000.

Pessina, Giorgio; and Perobelli, Aldo. Device for loading signatures for application to signature locating assemblies in bookbinding apparatus. 4,618,136, Cl. 271-150.000.

Peter, Diethard: *See—*
Brettschneider, Horst; Hartl, Walter; and Peter, Diethard, 4,618,977, Cl. 378-139.000.

Peterman, Robert J., to Spacesaver Corporation. Anti-tip device. 4,618,191, Cl. 312-201.000.

Petroleum Fermentations N.V.: *See—*
Hayes, Michael E.; Hrebenar, Kevin R.; Murphy, Patricia L.; Futch, Laurence E., Jr.; and Deal, James F., III, 4,618,348, Cl. 44-51.000.

Petts, Nigel J.; and Marsh, John, to Dobson Park Industries Plc. Valve assemblies. 4,617,954, Cl. 137-110.000.

Pfaff, Wayne K. Low insertion force socket. 4,618,199, Cl. 339-74.00R.

Pfeiffer, J. David. Speech synthesizer. 4,618,985, Cl. 381-51.000.

Pfizer Inc.: *See—*
Alker, David; Campbell, Simon F.; and Cross, Peter E., 4,618,609, Cl. 514-236.000.
Richardson, Kenneth; Bass, Robert J.; and Cooper, Kelvin, 4,618,616, Cl. 514-340.000.

Pflaum, Hermann; and Vojacek, Herbert, to Feldmuhle Aktiengesellschaft. Friction partners for lubricated friction couplings. 4,618,049, Cl. 192-107.00M.

Pheasant, Stephen T.: *See—*
Barnes, Andrew; Elliott, Gary K.; MacFarlane, William; and Pheasant, Stephen T., 4,618,079, Cl. 222-591.000.

Phillips Petrolem Company: *See—*
Dietz, Richard E., 4,618,595, Cl. 502-108.000.

Phillips Petroleum Company: *See—*
Allison, George M., III, 4,618,433, Cl. 252-8.514.
Drake, Charles A., 4,618,722, Cl. 568-59.000.
Kaus, Malcolm J.; and Miro, Nemesio D., 4,618,661, Cl. 526-114.000.
Skraba, Frank W., 4,618,051, Cl. 196-139.000.

Phillips, Roger: *See—*
Maxwell, Duane S.; Phillips, Roger; and Schwan, Eduard A., 4,618,965, Cl. 375-10.000.

Piacentino, PierLuigi: *See—*
Salvagno, Elvio; and Piacentino, PierLuigi, 4,618,820, Cl. 324-158.00F.

Pickens, Carl E.: *See—*
Dwiggins, Bruce L.; Pickens, Carl E.; and Niekamp, Carl W., 4,618,579, Cl. 435-96.000.

Picotte, Ronald T.: *See—*
Oldham, Steve A.; and Picotte, Ronald T., 4,618,341, Cl. 493-14.000.

Piggott, Richard G. Spray nozzle. 4,618,101, Cl. 239-589.000.

Pioneer Electronic Corporation: *See—*
Adachi, Hiroo, 4,618,834, Cl. 330-284.000.
Kawamura, Katsuaki, 4,618,998, Cl. 455-77.000.

Piper FM Limited: *See—*
Gayler, Robert J., 4,617,898, Cl. 123-460.000.

Pires, H. George. Method and apparatus for synchronizing a plurality of television signals. 4,618,880, Cl. 358-10.000.

Piretti, Giancarlo, to Castilia S.p.A. Folding ladder with three stiles. 4,618,027, Cl. 182-35.000.

Pitney Bowes Inc.: *See—*
Daniels, Edward P.; and Rinne, Risto A., Jr., 4,618,953, Cl. 371-12.000.

Pittman, Raymond H.; and Schultz, William J., to Masonite Corporation. Building panel. 4,617,774, Cl. 52-521.000.

Pittway Corporation: *See—*
Schoenfelder, George A.; Siegel, Stephen L.; and Slater, James S., 4,618,777, Cl. 250-381.000.

Plaisance, Thomas H.: *See—*
Katchko, John; Plaisance, Thomas H.; and Kriz, Karel, 4,618,657, Cl. 525-443.000.

PlasTek Corporation: *See—*
Lagasse, Charles A., 4,618,322, Cl. 425-129.00R.

Pneumatic Punchers Limited: *See—*
Kayes, Allan G., 4,618,007, Cl. 175-19.000.

Pohl, Jorg: *See—*
Scheffler, Gerhard; Niemeyer, Ulf; Brock, Norbert; and Pohl, Jorg, 4,618,692, Cl. 558-81.000.

Pointner, Martin; and Sommer, Rudiger, to Dr. Ing. Rudolf Hell GmbH. Electrode comb and method and device for manufacturing. 4,617,727, Cl. 29-825.000.

Polaroid Corporation: *See—*
Hardy, Herbert L., 4,618,803, Cl. 315-241.00R.
Hicks, John W., Jr., 4,618,258, Cl. 356-73.100.

Polaschegg, Hans-Dietrich, to Fresenius AG. Apparatus for peritoneal dialysis. 4,618,343, Cl. 604-29.000.

Polestak, Walter J.: *See—*
Thompson, Thomas D., III; Polestak, Walter J.; and Bradshaw, Robert W., 4,618,374, Cl. 106-288.00B.

Poliniak, Eugene S.: *See—*
McClelland, Sandra K.; and Poliniak, Eugene S., 4,618,514, Cl. 428-1.000.

Pollock, Jerry J.; and McNamara, Thomas F., to Research Foundation of the State University of New York. Dental compositions and method of use therefor. 4,618,489, Cl. 424-52.000.

Pomagalski S.A.: *See—*
Tarassoff, Serge, 4,617,829, Cl. 73-865.800.

Pomerenke, David E., to Creative Landscape Service, Inc. Nursery pot cutting tool. 4,617,713, Cl. 29-426.400.

Pongrac, Gaborne : *See—*
Batorfalvi, Geza; Lendvai, Tibor; Radai, Antal; Pongrac, Gaborne ; Szabo, Miklos; and Szilardi, Jeno , 4,617,700, Cl. 17-45.000.

Pope, Kent M.; and Hardesty, Bryan L., to Advanced Input Devices, Inc. Rocker key elastomer dome keyboard. 4,618,744, Cl. 200-5.00A.

Porcelli, Michele L., to Hershey Foods Corporation. Collator section of lasagna packer. 4,618,055, Cl. 198-422.000.

Porte, Hugues, to Rhone-Poulenc Specialites Chimiques. Disilane/organosilicon resin having enhanced thermomechanical properties. 4,618,666, Cl. 528-33.000.

Porteous, Don D.; and Wittrock, Paul M., to Van R Dental Products, Inc. Gingival retraction cord with wet, drip-free astringent. 4,617,950, Cl. 132-91.000.

Position Orientation Systems, Ltd.: *See—*
Hansen, Per K., 4,618,822, Cl. 324-207.000.

Poulsen, Martin E.: *See—*
Georgiou, George E.; and Poulsen, Martin E., 4,618,972, Cl. 378-34.000.

Poupard, Dominique: *See—*
Le Salver, Robert; and Poupard, Dominique, 4,618,127, Cl. 267-8.00R.

Powell, Clois E., to Ashland Oil, Inc. Method for preparing laminated articles. 4,618,390, Cl. 156-307.300.

Powell, Roger A. Adjustable inclination reading/writing board. 4,618,119, Cl. 248-456.000.

PPG Industries, Inc.: *See—*
Kania, Charles M.; and Dowbenko, Rostyslaw, 4,618,659, Cl. 525-455.000.

Pradere, Francois; and Frey, Robert, to Centre National de la Rechereche Scientifique. Production of short light pulses by time compression. 4,618,783, Cl. 307-426.000.

Prasad, Yellapregada V. R. K.: *See—*
Gegel, Harold L.; Malas, James C.; Prasad, Yellapregada V. R. K.; Doraivelu, Sokka M.; Barker, Douglas R.; Morgan, James T., Jr.; and Lark, Kristine A., 4,617,817, Cl. 72-364.000.

Pratt Burnerd International Limited: *See—*
Jackson, Joseph F., 4,617,721, Cl. 29-568.000.

Premoli, Pietro; Manzoni, Angelo; and Calzi, Claudio. Method for the quantitative determination of calcium in biological fluids through direct potentiometry. 4,618,587, Cl. 436-74.000.

Pricone, Robert M.; Roberts, William N.; and Zanotti, Richard, to Amerace Corporation. Retroreflective sheeting and methods for making same. 4,618,518, Cl. 428-40.000.

Prillieux, Marcel; Laurent, Robert M.; and Tirtiaux, Robert, to Exxon Research & Engineering Co. Sulphonic acids and sulphonates. 4,618,458, Cl. 260-505.00P.

Prima Industrie S.p.A.: *See—*
Gilli, Luigi; and Peiretti, Domenico, 4,618,758, Cl. 219-121.0LG.

Pritchett, James D.; and Cutbush, James D., to Booth, Inc. Involute coil cold plate. 4,617,807, Cl. 62-399.000.

Procter & Gamble Company, The: *See—*
Wells, Robert L., 4,618,344, Cl. 8-161.000.

Production Systems, Inc.: *See—*
Howser, M. Gene, 4,618,057, Cl. 198-861.200.

Production Techniques Limited: *See—*
Yates, Martyn R. G., 4,618,425, Cl. 210-416.100.

Provost, R. J.: *See—*
Dubois, Harvey W.; and Heselton, Fred, 4,618,857, Cl. 340-654.000.

Puckering, Donald R.: *See—*
Palfery, Kenneth J.; Puckering, Donald R.; Kocev, Angel; and Maharaj, Kenrick B., 4,617,720, Cl. 29-568.000.

Puhak, Peter G.: *See—*
Donofrio, Robert L.; and Puhak, Peter G., 4,618,206, Cl. 339-144.00T.

Purex Corporation: *See—*
Hudson, John O.; Schleien, Mickey M.; and Barrett, John, 4,618,444, Cl. 252-92.000.

Putzig, Donald E., to Du Pont de Nemours, E. I., and Company. Organic titanium compositions for use in oil and gas wells. 4,618,435, Cl. 252-8.551.

Quantronix Corporation: *See—*
Liu, Kuo-Ching, 4,618,957, Cl. 372-22.000.

Queen's University at Kingston: *See—*
Saunders, Gerald A. B., 4,617,930, Cl. 128-317.000.

Queneau, Paul B.: *See—*
Hazen, Wayne W.; Thompson, David L.; Reynolds, James E.; Lombardo, Nicholas J.; Queneau, Paul B.; and Hager, John P., 4,618,480, Cl. 423-127.000.

Quick-Set Incorporated: *See—*
Mooney, Paul C., 4,618,886, Cl. 358-108.000.

Quong, Paul. Shipping-and-storage container. 4,618,069, Cl. 220-23.400.

R.R. McGlogan Equipment Ltd.: *See—*
Cybulski, Laurence P.; and McGlogan, Robert R., 4,617,824, Cl. 73-49.700.

Rabushka, Charles; and Reprogle, Layton J. Tension actuated uncoupler. 4,617,975, Cl. 141-311.00R.

Radai, Antal: *See—*
Batorfalvi, Geza; Lendvai, Tibor; Radai, Antal; Pongrac, Gaborne ; Szabo, Miklos; and Szilardi, Jeno , 4,617,700, Cl. 17-45.000.

Raduechel, Bernd: *See—*
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Mannesmann, Gerda; Nieuweboer, Bob; and Town, Michael-Harold, 4,618,626, Cl. 514-530.000.

Rafal, Marc D.; Burton, Larry W.; and Joines, William T., to Avnet, Inc. Dual pilot phase lock loop for radio frequency transmission. 4,618,996, Cl. 455-46.000.

Rain Bird Consumer Products Mfg. Corp.: *See—*
White, Glenn S.; Mussler, Karl J.; and Van Exel, Gary A., 4,618,100, Cl. 239-440.000.

Rajeevakumar, Thekkemadathil V.: *See—*
Chappell, Barbara A.; Rajeevakumar, Thekkemadathil V.; Schuster, Stanley E.; and Terman, Lewis M., 4,618,784, Cl. 307-449.000.

Rakoczy nee Pinter, Eva: *See—*
Budai, Zoltan; Benko, Pal; Ratz nee Simonek, Ildiko ; Rakoczy nee Pinter, Eva; Magyar, Karoly; Kelemen, Jozsef; and Mandi, Attila, 4,618,623, Cl. 514-478.000.

Ralph McKay Limited: *See—*
Young, Hartley F.; and Collins, John, 4,618,093, Cl. 238-283.000.

Rampignon, Marc, to Compagnie Industrielle de Mecanismes en agrege C.I.M. Electric motor for driving elements of motor vehicles in two opposite directions with a higher resisting force in one direction than in the other, such as window raisers or pivotal seat backs. 4,618,794, Cl. 310-234.000.

Ramras, Daniel M.: *See—*
Santillie, Paul W.; and Ramras, Daniel M., 4,618,479, Cl. 422-202.000.

Ramu International: *See—*
Smith-Johannsen, Robert, 4,618,369, Cl. 106-95.000.

Ranco Incorporated: *See—*
Rossi, Guglielmo, 4,617,803, Cl. 62-209.000.

Rand, Roy E.; Mitchell, John W. J.; and Couch, John L., to Imatron, Inc. Beam positioning arrangement for use in a scanning electron beam computed tomography scanner and method. 4,618,970, Cl. 378-10.000.

Rank Electronic Tubes, Inc.: *See—*
Gorman, Kenneth G., Jr., 4,618,800, Cl. 313-417.000.

Rao, Bookinkere C. S.: *See—*
Madan, Gulzari L.; and Rao, Bookinkere C. S., 4,618,445, Cl. 252-99.000.

Rapoport, Henry; and Buckley, Thomas F., III, to University of Calif., The Regents of the. Preparation of optically active ketones. 4,618,710, Cl. 564-1.000.

Rappinger, Bo; and Stenkvist, Sven-Einar, to ASEA AB. Direct current arc furnace. 4,618,963, Cl. 373-72.000.

Rattunde, Manfred; Steuer, Herbert K.; and Wolf, Hans-Jurgen, to Reimers Getriebe AG. Link chain for a variable ratio cone pulley transmission. 4,618,338, Cl. 474-245.000.

Ratz nee Simonek, Ildiko : *See—*
Budai, Zoltan; Benko, Pal; Ratz nee Simonek, Ildiko ; Rakoczy nee Pinter, Eva; Magyar, Karoly; Kelemen, Jozsef; and Mandi, Attila, 4,618,623, Cl. 514-478.000.

Ratzlaff, Howard J.: *See—*
Fell, Ferol S.; and Ratzlaff, Howard J., 4,617,786, Cl. 56-13.400.

Ray, Edgar C.; and Kohl, William A. Electrical outlet safety device. 4,618,740, Cl. 174-67.000.

Raynal, Jean C., to Teleco Oilfield Services Inc. Insulating segment for a drill string electrode structure. 4,618,828, Cl. 324-347.000.

Raytheon Company: *See—*
Collins, John D., 4,618,863, Cl. 342-194.000.

RCA Corporation: *See—*
Bruestle, John H., 4,618,849, Cl. 340-347.0DD.
Carrell, Ross M.; and Whitley, George J., 4,617,731, Cl. 29-861.000.
Harwood, Leopold A.; Chin, Danny; and Law, Kirk A., 4,618,882, Cl. 358-31.000.
Keigler, John E., 4,618,112, Cl. 244-158.00R.
Maile, Donald W., 4,618,770, Cl. 250-338.000.
McClelland, Sandra K.; and Poliniak, Eugene S., 4,618,514, Cl. 428-1.000.
Otto, Jack F.; and Colacello, Michael A., 4,618,355, Cl. 65-36.000.
Stewart, Roger G.; and Ipri, Alfred C., 4,618,876, Cl. 357-54.000.
White, Lawrence K.; Miszkowski, Nancy A.; and Levine, Aaron W., 4,618,565, Cl. 430-271.000.

Read, John I.; and Roderick, Raymond T., to Vickers, Incorporated. Two-stage hydraulic valves. 4,617,967, Cl. 137-625.640.

Redington, Rowland W.; and Axel, Leon, to General Electric Company. Method for high-spatial-resolution spectroscopic NMR imaging of chemically-shifted nuclei. 4,618,827, Cl. 324-309.000.

Redpath, Anthony E.: *See—*
Guillet, James E.; and Redpath, Anthony E., 4,618,566, Cl. 430-271.000.

Reed Tool Company: *See—*
Badrak, Robert P.; and Mayo, Terry H., 4,618,269, Cl. 384-95.000.

Rees, Fenton L.: *See—*
Hagerman, James E.; Mathewes, William D.; Rees, Fenton L.; and Flack, Albert J., 4,618,810, Cl. 318-803.000.

Regan, Michael T.: *See—*
Borsenberger, Paul M.; Regan, Michael T.; and Staudenmayer, William J., 4,618,560, Cl. 430-130.000.

Regel, Erik; Buchel, Karl H.; Reinecke, Paul; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Substituted t-butanol fungicidal agents. 4,618,619, Cl. 514-383.000.

Reibakh, Judel S., to Experimentalny Nauchno-Issledovatelsky Institut Metallorezhuschikh Stankov. NC vertical spindle jig grinder. 4,617,764, Cl. 51-165.710.

Reichardt, Walter: *See—*
Steinke, Gerhard; Fels, Peter; Hoeg, Wolfgang; Lorenz, Werner; Ahnert, Wolfgang; Steffen, Frank; and Reichardt, Walter, 4,618,987, Cl. 381-82.000.

Reier, Gerald J. Filter bag assembly. 4,618,353, Cl. 55-378.000.

Reimer, William A., to GTE Communication Systems Corp. Cable clamp. 4,618,113, Cl. 248-56.000.

Reimers Getriebe AG: *See—*
Rattunde, Manfred; Steuer, Herbert K.; and Wolf, Hans-Jurgen, 4,618,338, Cl. 474-245.000.

Reinecke, Paul: *See—*
Regel, Erik; Buchel, Karl H.; Reinecke, Paul; and Brandes, Wilhelm, 4,618,619, Cl. 514-383.000.

Reineke, Karl E.: *See—*
Bay, W. Elliot; and Reineke, Karl E., 4,618,719, Cl. 568-17.000.
Bay, W. Elliott; Reineke, Karl E.; and Weil, Edward D., 4,618,720, Cl. 568-17.000.

Reiter, Karl: *See—*
Hasler, Franz; Monch, Ernst; Reiter, Karl; and Timm, Heinrich, 4,618,163, Cl. 280-785.000.

Renken, Terry L.; and Knifton, John F., to Texaco Inc. Catalytic process for the production of primary amines from oxyethylene glycol monoalkyl ethers. 4,618,717, Cl. 564-475.000.

REPA Feinstanzwerk GmbH: *See—*
Seifert, Helmut; and Mondel, Karl, 4,618,165, Cl. 280-808.000.

Reprogle, Layton J.: *See—*
Rabushka, Charles; and Reprogle, Layton J., 4,617,975, Cl. 141-311.00R.

Research Foundation of the State University of New York: *See—*
Pollock, Jerry J.; and McNamara, Thomas F., 4,618,489, Cl. 424-52.000.

Resnick, Sharon H. Beach hand cart. 4,618,157, Cl. 280-8.000.

Resource Engineering Incorporated: *See—*
Schapiro, Norman; and Moreau, Eugene J., 4,618,346, Cl. 44-1.00A.

Resource Technology Associates: *See—*
Hazen, Wayne W.; Thompson, David L.; Reynolds, James E.; Lombardo, Nicholas J.; Queneau, Paul B.; and Hager, John P., 4,618,480, Cl. 423-127.000.

Resources Conservation Co.: *See—*
Herrigel, Howard R., 4,618,429, Cl. 210-652.000.

Reuschling, Dieter: *See—*
Linkies, Adolf; and Reuschling, Dieter, 4,618,455, Cl. 260-543.00F.

Reuther, Wolfgang: *See—*
Ebel, Klaus; and Reuther, Wolfgang, 4,618,676, Cl. 544-196.000.

Reynolds, Carl D.: *See—*
Carter, Thurman B.; Reynolds, Carl D.; and Mundorf, Larry R., 4,618,009, Cl. 175-267.000.

Reynolds, James E.: *See—*
Hazen, Wayne W.; Thompson, David L.; Reynolds, James E.; Lombardo, Nicholas J.; Queneau, Paul B.; and Hager, John P., 4,618,480, Cl. 423-127.000.

Rhone-Poulenc Industries: *See—*
Gauthier-Lafaye, Jean; and Perron, Robert, 4,618,460, Cl. 260-549.000.

Rhone-Poulenc Sante: *See—*
Corbet, Jean-Pierre; Cotrel, Claude; Farge, Daniel; and Paris, Jean-Marc, 4,618,599, Cl. 514-11.000.

Rhone-Poulenc Specialites Chimiques: *See—*
Desbois, Michel, 4,618,726, Cl. 568-322.000.
Porte, Hugues, 4,618,666, Cl. 528-33.000.

Riccio, Louis M.: *See—*
Bosna, Alexander A.; and Riccio, Louis M., 4,618,504, Cl. 427-34.000.

Rice, Graham: *See—*
Triggs, Geoffrey W.; Lightowlers, Richard J.; Robinson, Derek; and Rice, Graham, 4,617,985, Cl. 165-32.000.

Rice, Stephen G.: *See—*
Morrill, Giles W.; and Rice, Stephen G., 4,618,791, Cl. 310-90.000.

Richard Wolf GmbH: *See—*
Riedlinger, Rainer, 4,618,796, Cl. 310-311.000.

Richards Medical Company: *See—*
Griggs, Calvin, 4,617,922, Cl. 128-92.0YS.

Richardson, Edwin A., to Shell Oil Company. Determining residual oil saturation by injecting CO_2 and base generating reactant. 4,617,994, Cl. 166-250.000.

Richardson, Kenneth; Bass, Robert J.; and Cooper, Kelvin, to Pfizer Inc. Cyclopropylidene antifungal agents. 4,618,616, Cl. 514-340.000.

Richter Gedeon Vegyeszeti Gyar Rt: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,618,611, Cl. 514-255.000.
Trinn, Maria; Kordik, Gabriella; Udvardy-Nagy nee Cserey Pechaany, Eva; Vida, Zsuzsanna; and Zsoka nee Somkuti, Rzsebet, 4,618,581, Cl. 435-119.000.

Rickett, Roger G.; and Spooner, Eric, to Metal Box Public Limited Company. Conveying apparatus. 4,618,052, Cl. 198-370.000.

Ricoh Company, Ltd.: *See*—
Hashimoto, Mitsuru, 4,618,672, Cl. 534-658.000.
Inoue, Takashi, 4,618,870, Cl. 346-76.0PH.
Kuramoto, Shinichi; and Takanashi, Hajime, 4,618,558, Cl. 430-115.000.
Shibata, Isamu; and Kanmoto, Yoshiaki, 4,618,958, Cl. 372-29.000.

Riedlinger, Rainer, to Richard Wolf GmbH. Acoustic diode. 4,618,796, Cl. 310-311.000.

Riedweg, Robert: *See*—
Beer, Christian; Riedweg, Robert; and Schlensog, Klaus, 4,617,912, Cl. 128-1.00B.

Rieke Corporation: *See*—
Hamman, Martin E.; and Baughman, Gary M., 4,618,078, Cl. 222-478.000.

Rigler, Josef K.; and Leithauser, Horst, to Chemische Werke Huls Aktiengesellschaft. Method for controlling bead size in the production of expandable styrene polymers by suspension polymerization. 4,618,468, Cl. 264-53.000.

Riha, Gerd, to Siemens Aktiengesellschaft. Electronic component functioning with reflected acoustic waves. 4,618,841, Cl. 333-195.000.

Rinne, Risto A., Jr.: *See*—
Daniels, Edward P.; and Rinne, Risto A., Jr., 4,618,953, Cl. 371-12.000.

Ritter, George E.: *See*—
Kamens, Bruce H.; and Ritter, George E., 4,618,264, Cl. 368-74.000.

Riv-Skf Officine Di Villar Perosa S.p.A.: *See*—
Veglia, Bartolomeo, 4,618,130, Cl. 267-153.000.

Rizkalla, Nabil, to Halcon SD Group, Inc., The. Process for conversion of acid anhydrides to alkylidene diesters. 4,618,705, Cl. 560-263.000.

Robert Bosch GmbH: *See*—
Esper, Friedrich; and Frey, Thomas, 4,618,351, Cl. 55-146.000.
Flohrs, Peter, 4,618,875, Cl. 357-46.000.
Handtmann, Dieter; Mossburger, Egon; and Forster, Herbert, 4,618,913, Cl. 361-315.000.
Hofmann, Karl; Mladek, Walter; and Kaczynski, Bernhard, 4,618,097, Cl. 239-124.000.
Hornung, Friedrich, 4,618,805, Cl. 318-245.000.
Kochannek, Franz, 4,618,319, Cl. 418-136.000.

Roberts, David; and Hillier, Clyde. Electrical plug restraint system. 4,618,200, Cl. 339-75.00P.

Roberts, William N.: *See*—
Pricone, Robert M.; Roberts, William N.; and Zanotti, Richard, 4,618,518, Cl. 428-40.000.

Robinson, Derek: *See*—
Triggs, Geoffrey W.; Lightowlers, Richard J.; Robinson, Derek; and Rice, Graham, 4,617,985, Cl. 165-32.000.

Robison, Robert S.; and Doremus, Michael G., to E. R. Squibb & Sons, Inc. Method of preparing L-(+)-β-hydroxyisobutyric acid by fermentation. 4,618,583, Cl. 435-146.000.

Rockwell International Corporation: *See*—
Knapp, Janet S.; and Hillman, Jerry L., 4,617,796, Cl. 60-39.790.
Weber, James L.; and Davidson, Donald J., 4,618,034, Cl. 188-73.360.

Roderick, Raymond T.: *See*—
Read, John I.; and Roderick, Raymond T., 4,617,967, Cl. 137-625.640.

Rodgers, Ian W.: *See*—
Ross, Peter F.; Rodgers, Ian W.; and Goodings, Rupert L., 4,618,846, Cl. 340-347.0DD.

Roeske, Klaus J.: *See*—
Bishop, Arthur E.; and Roeske, Klaus J., 4,618,297, Cl. 409-58.000.

Rogers, Peter G., to Security & Auto Electrical Designs Ltd. Automobile door locking systems. 4,617,812, Cl. 70-218.000.

Roggero, Arnaldo; and Bruzzone, Mario, to Enichem Polimeri, S.p.A. Method for the termination of living polymers, and compounds suitable for the purpose. 4,618,449, Cl. 252-182.000.

Rolls-Royce Limited: *See*—
Mills, David, 4,617,977, Cl. 164-30.000.

Rolls-Royce plc: *See*—
Palmer, Charles R., 4,618,094, Cl. 239-265.370.

Roop, Stevie C., to Medeco Security Locks, Inc. Mechanism for operating a drop-bolt door lock. 4,617,811, Cl. 70-131.000.

Roper, Hartmut: *See*—
Bilharz, Manfred; Heider, Peter; Roper, Hartmut; Taal, Martin; Henken, Fritz; Kohl, Ernst; and Schubert, Dietmar, 4,618,123, Cl. 251-28.000.

Roques, Bernard; Schwartz, Jean-Charles; and Lecomte, Jeanne-Marie. Amino acid derivative. 4,618,708, Cl. 562-448.000.

Rose Manufacturing Company: *See*—
Olson, Wayne L., 4,618,026, Cl. 182-4.000.

Rosemount Inc.: *See*—
Hagen, Floyd W., 4,617,826, Cl. 73-182.000.

Rosen, Meyer R.: *See*—
Fan, You-Ling; Brode, George L.; and Rosen, Meyer R., 4,618,647, Cl. 524-801.000.

Rosenstein, Robert; Aspden, Kim P.; and Stopa, Peter, to Becton Dickinson and Company. Diagnostic test for Streptococcus A. 4,618,576, Cl. 435-7.000.

Roskos, Kenneth B.: *See*—
Kay, Edward L.; and Roskos, Kenneth B., 4,618,667, Cl. 528-49.000.

Ross, Peter F.; Rodgers, Ian W.; and Goodings, Rupert L., to Crosfield Electronics Limited. Data coding. 4,618,846, Cl. 340-347.0DD.

Rossi, Guglielmo, to Ranco Incorporated. Temperature responsive control units. 4,617,803, Cl. 62-209.000.

Rothblatt, Noah S.: *See*—
Heinzelmann, Fred J.; Rothblatt, Noah S.; Glass, James P., Jr.; Say, Geoffrey R.; Chludzinski, George R.; Sartori, Guido; and Ho, W. S. Winston, 4,618,481, Cl. 423-228.000.

Rotron, Inc.: *See*—
Grouse, Alan, 4,618,806, Cl. 318-254.000.

Roussel Uclaf: *See*—
Tessier, Jean; and Girault, Pierre, 4,618,364, Cl. 71-92.000.

Rowe, Charles M.: *See*—
Cooper, Glenn D.; Butler, John M., III; Morrison, Darrell R.; Senic, Charles L.; Nilsson, Lennart S.; and Rowe, Charles M., 4,618,795, Cl. 310-260.000.

Rowe, Frederick; and Jackson, Peter N., to Imperial Chemical Industries Plc. Gas-liquid contacting. 4,618,350, Cl. 55-92.000.

Roy, Kurt: *See*—
Silber, Dieter; Sawitzki, Friedhelm; and Roy, Kurt, 4,618,781, Cl. 307-252.00C.

RTE Corporation: *See*—
Johnson, Allen L., 4,618,116, Cl. 248-222.100.

Rubenfeld, Viktor P., to SEQUENCE. Device for protection of digital data. 4,618,061, Cl. 206-444.000.

Rudert, Wolfgang: *See*—
Heberle, Hans-Jorg; and Rudert, Wolfgang, 4,617,903, Cl. 123-501.000.

Ruhl, Karl; and Bildner, Karlheinz, to Rutgerswerke Aktiengesellschaft. Corrosion protection sheet. 4,618,521, Cl. 428-137.000.

Ruhovets, Naum, to Halliburton Company. Well logging analysis methods for use in complex lithology reservoirs. 4,617,825, Cl. 73-152.000.

Ruhrgas Aktiengesellschaft: *See*—
Gloria, Karl F. L.; Costinescu-Tataranu, Alexandru B.; Schuster, Wilhelm; and Wittekind, Jurgen, 4,618,282, Cl. 405-53.000.

Russell, Ronald W., to National Semiconductor Corporation. Operational amplifier offset trim that does not change the offset potential temperature drift. 4,618,833, Cl. 330-256.000.

Rustogi, Kedar N.: *See*—
Donohue, John J.; Dunn, William J.; and Rustogi, Kedar N., 4,617,918, Cl. 128-66.000.

Ruston, Donald A.: *See*—
Campbell, James R., 4,618,152, Cl. 277-53.000.

Rusyniak, Michael F. Single message recorder and playback apparatus. 4,618,896, Cl. 360-1.000.

Rutgerswerke Aktiengesellschaft: *See*—
Ruhl, Karl; and Bildner, Karlheinz, 4,618,521, Cl. 428-137.000.

Rybicki, Mathew A.: *See*—
Kelley, Stephen H.; and Rybicki, Mathew A., 4,618,852, Cl. 340-347.0AD.

Ryco Graphic Manufacturing, Inc.: *See*—
Switall, Thomas G., 4,617,865, Cl. 101-350.000.

Ryu, Nobuyuki, to Toyota Jidosha Kabushiki Kaisha. Seatbelt assembly. 4,618,164, Cl. 280-804.000.

S. A. Martin: *See*—
Torti, Mario; and Fernandez, Emilio, 4,618,391, Cl. 156-353.000.

S. G. D' or Industries, Inc.: *See*—
Grandis, Stanley, 4,617,685, Cl. 2-338.000.

Saab-Scania Aktiebolag: *See*—
Johansson, Sven H.; and Nytomt, Jan G., 4,617,907, Cl. 123-647.000.
Norlin, Stig I., 4,618,023, Cl. 180-312.000.

Saarbergwerke AG: *See*—
Hartan, Hans-Georg; Padberg, Werner; and Muller, Dietrich, 4,618,414, Cl. 209-5.000.

Sabee, Reinhardt N. Method for applying an elastic band to diapers. 4,618,384, Cl. 156-205.000.

Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; Oltmann, Harold D.; and Chen, Shu P., to Allied Corporation. Polymer films containing platelet particles. 4,618,528, Cl. 428-216.000.

Sada, Masao; Kato, Michio; Ayano, Masami; Abe, Tadashi; and Moriwaki, Masanori, to Sumitomo Chemical Company, Limited. Waste water treatment in the production of methacrylic acid. 4,618,709, Cl. 562-532.000.

Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, to Toyama Chemical Co., Ltd. Antibiotic 7-(thiazolyl)-3-(pyrazinylmethyl) or (pyridazinylmethyl) cephalosporins. 4,618,606, Cl. 514-202.000.

Sadhir, Rajender K., to Westinghouse Electric Corp. Method of making a capacitor winding. 4,618,507, Cl. 427-41.000.

Sager, Thomas B., to Branson Ultrasonics Corporation. Ultrasonic welding of thermoplastic workpieces. 4,618,516, Cl. 428-35.000.

Saikawa, Isamu: *See*—
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,618,606, Cl. 514-202.000.

Saint-Gobain Vitrage: *See*—
Emonts, Heinfried; and Gebhardt, Franz, 4,618,538, Cl. 428-428.000.
Karla, Heinz, 4,618,088, Cl. 228-124.000.
Saito, Hideo: *See*—
Honma, Minoru; Hattori, Toshihiro; Saito, Hideo; and Ishihara, Masaki, 4,618,040, Cl. 192-0.090.
Saito, Hiromitsu: *See*—
Hirata, Tadashi; Saito, Hiromitsu; and Morimoto, Makoto, 4,618,687, Cl. 549-396.000.
Saito, Junya: *See*—
Yamada, Hisafumi; Kurik, Choei; and Saito, Junya, 4,618,891, Cl. 358-153.000.
Saito, Tadao: *See*—
Nishimura, Takumi; and Saito, Tadao, 4,618,188, Cl. 303-116.000.
Saito, Toranosuke; Kitani, Masakatu; and Ohishi, Hiroyuki, to Sanko Kaihatsu Kagaku Kenkyusho. Cyclic organic phosphorus compound and process for producing same. 4,618,693, Cl. 558-82.000.
Saito, Yoshinori: *See*—
Yamanouchi, Katsuto; Saitoh, Katsuo; Saito, Yoshinori; and Kikyohara, Tadashi, 4,618,417, Cl. 210-149.000.
Saito, Yukio, to Alps Electric Co., Ltd. Magnetic disk and spindle for driving the same. 4,618,900, Cl. 360-97.000.
Saitoh, Katsuo: *See*—
Yamanouchi, Katsuto; Saitoh, Katsuo; Saito, Yoshinori; and Kikyohara, Tadashi, 4,618,417, Cl. 210-149.000.
Sakabe, Yukio; Karaki, Shintaro; and Nakano, Kiyoshi, to Murata Manufacturing Co., Ltd. Monolithic ceramic capacitor. 4,618,912, Cl. 361-309.000.
Sakaguchi, Yoshikazu: *See*—
Ogasawara, Tsunehiko; Arakawa, Yoshichika; Sumiya, Koji; and Sakaguchi, Yoshikazu, 4,618,038, Cl. 192-3.290.
Sakai, Ryukichi: *See*—
Ozaki, Yukio; Fujisawa, Osamu; Sakai, Ryukichi; and Hasegawa, Hiroshi, 4,618,752, Cl. 200-148.00R.
Sakai, Satoshi: *See*—
Okita, Masao; and Sakai, Satoshi, 4,618,951, Cl. 369-270.000.
Sakai, Shinzo: *See*—
Nishikawa, Masao; Sakai, Shinzo; and Miyake, Junichi, 4,618,037, Cl. 192-3.300.
Sakai, Tadashi; and Naruse, Nobutaka, to Hoshizaki Electric Co., Ltd. Liquid level control apparatus. 4,617,806, Cl. 62-347.000.
Sakakibara, Hiroyuki; Akita, Shigeyuki; Kodera, Masao; and Maeno, Tsuyoshi, to Nippon Soken, Inc. Apparatus for detecting obstructions behind vehicle. 4,618,948, Cl. 367-104.000.
Sakakibara, Koji; Haraguchi, Hiroshi; and Yukumoto, Hideki, to Nippondenso Co., Ltd. Anti-knocking control in internal combustion engine. 4,617,895, Cl. 123-425.000.
Sakakiyama, Ryuzo: *See*—
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, 4,617,840, Cl. 74-865.000.
Sakamoto, Takashi, to Dainippon Screen Seizo Kabushiki Kaisha. Photographic apparatus and measurement method of exposure conditions. 4,618,239, Cl. 354-477.000.
Sakamoto, Takashi, to Dainippon Screen Mfg. Co. Method of editing image signal. 4,618,883, Cl. 358-78.000.
Sakamoto, Takayoshi: *See*—
Uemura, Seiichi; Hirose, Takao; Shohda, Yoshio; Sakamoto, Takayoshi; and Katoh, Kenji, 4,618,463, Cl. 264-29.200.
Sakamoto, Tooru: *See*—
Nakamura, Motoharu; Hirose, Kikuzi; and Sakamoto, Tooru, 4,618,377, Cl. 148-6.15R.
Sakata, Souji: *See*—
Miura, Haruo; Nagaoka, Takashi; Abe, Yoshiaki; and Sakata, Souji, 4,618,311, Cl. 415-149.00R.
Sakmann, Walter H.: *See*—
Lang, Albrecht; and Sakmann, Walter H., 4,618,782, Cl. 307-255.000.
Sakuma, Shunji: *See*—
Ashikawa, Noboru; and Sakuma, Shunji, 4,618,021, Cl. 180-248.000.
Sakurai, Masaaki; and Kagiura, Kazuo, to Canon Kabushiki Kaisha. Heating device having a heat insulating roller. 4,618,240, Cl. 355-3.0FU.
Sakurai, Masaki: *See*—
Abe, Ryozo; and Sakurai, Masaki, 4,618,950, Cl. 369-32.000.
Sakurai, Takayasu; and Iizuka, Tetsuya, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device. 4,618,945, Cl. 365-189.000.
Salford University Industrial Centre Limited: *See*—
Benn, Frederick R.; and McAuliffe, Charles A., 4,618,736, Cl. 585-240.000.
Saligny, Yves, to Carpano & Pons. Connection device. 4,618,204, Cl. 339-99.00R.
Salisbury, Winfield W., to Stanton, Austin N., a part interest. Magnetic confinement nuclear energy generator. 4,618,470, Cl. 376-123.000.
Salter, James A.: *See*—
Siddoway, Mark A.; Salter, James A.; and Deschner, Robert P., 4,617,744, Cl. 34-168.000.
Salvagno, Elvio; and Piacentino, PierLuigi, to Honeywell Information Systems Italia. Probe support for test fixture of printed circuit artworks. 4,618,820, Cl. 324-158.00F.
Samsonite Corporation: *See*—
Gregg, James S.; and Mobley, Lawrence R., 4,618,058, Cl. 206-291.000.
Sanders, James L. Static discharge device. 4,618,909, Cl. 361-212.000.
Sandland, Paul; Chadwick, Curt H.; Singleton, Russell M.; and Dwyer, Howard, to KLA Instruments Corporation. Method and apparatus for automatic wafer inspection. 4,618,938, Cl. 364-552.000.
Sandling, Michael J., to Xomox Corporation. Rotary plug valve. 4,617,957, Cl. 137-315.000.
Sandoz Ltd.: *See*—
Dore, Jacky, 4,618,673, Cl. 534-698.000.
Wu, Frank, 4,618,359, Cl. 71-88.000.
Sanko Kaihatsu Kagaku Kenkyusho: *See*—
Saito, Toranosuke; Kitani, Masakatu; and Ohishi, Hiroyuki, 4,618,693, Cl. 558-82.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Mori, Atsushi, 4,617,879, Cl. 123-73.0AD.
Santarelli, Paul: *See*—
Cohn, Robert J.; Olsson, Frank C.; Holzman, James W.; and Santarelli, Paul, 4,618,067, Cl. 220-1.500.
Santillie, Paul W.; and Ramras, Daniel M., to Lamb-Weston, Inc. Apparatus for producing chlorine dioxide. 4,618,479, Cl. 422-202.000.
Santoro, Vincent J.: *See*—
Kozyra, William L.; MacIsaac, Andrew B.; and Santoro, Vincent J., 4,618,159, Cl. 280-93.000.
Santrade Limited: *See*—
von Holst, Johan P.; and Oskarsson, Rolf G., 4,618,540, Cl. 428-552.000.
Sanyo Electric Co., Ltd.: *See*—
Doutsubo, Nobuhide, 4,618,899, Cl. 360-73.000.
Nohara, Kazunori; Tanmatsu, Katsuo; Hosoya, Nobukazu; and Higashino, Takeshi, 4,618,888, Cl. 358-120.000.
Sargent, Brenda A.: *See*—
Peel, Harry H.; Brisco, John S.; Moczygemba, Mark E.; Neatherlin, Robert L.; and Sargent, Brenda A., 4,617,937, Cl. 128-680.000.
Sartor, Rino; and Bottega, Giampietro, to Celes Optical S.r.l. Spring mount hinge for eyeglasses bows. 4,618,226, Cl. 351-113.000.
Sartori, Guido: *See*—
Heinzelmann, Fred J.; Rothblatt, Noah S.; Glass, James P., Jr.; Say, Geoffrey R.; Chludzinski, George R.; Sartori, Guido; and Ho, W. S. Winston, 4,618,481, Cl. 423-228.000.
Sartori, Vittore, to Ciba-Geigy Corporation. Process for the preparation of nitrodiphenyl disulfides. 4,618,721, Cl. 568-23.000.
Sasaki, Junzo; Hitomi, Mitsuo; and Kazuhiko, Ueda, to Mazda Motor Corporation. Intake system for internal combustion engines. 4,617,897, Cl. 123-432.000.
Sasaki, Masami: *See*—
Shimoda, Takashi; and Sasaki, Masami, 4,618,396, Cl. 156-605.000.
Sasaki, Michiaki; and Mizusawa, Akira, to Nissan Motor Company, Limited; and NIFCO Incorporated. Filter device for a fuel tank. 4,618,422, Cl. 210-172.000.
Sasaki, Yutaka; Kiyomiya, Yutaka; and Nakamura, Toshio, to Nitto Chemical Industry Co., Ltd. Process for improving activity of tellurium containing metal oxide catalysts. 4,618,593, Cl. 502-20.000.
Sasamori, Eizo: *See*—
Takano, Katsuhiko; Iijima, Shigeharu; Yoshihara, Satoshi; Matsushima, Masaaki; Kishi, Hiroyoshi; and Sasamori, Eizo, 4,618,537, Cl. 428-336.000.
Sasano, Akira; Seki, Kouichi; Yamamoto, Hideaki; Baji, Toru; and Tsukada, Toshihisa, to Hitachi, Ltd. Thin film device. 4,618,873, Cl. 357-23.700.
Sasano, Ryoichiro; Toyohara, Tsutomu; and Takigawa, Toshimichi, to Mitsubishi Jukogio Kabushiki Kaisha. Method and apparatus for working peripheral wall of hemispherical shell. 4,617,845, Cl. 82-1.00C.
Sashiki, Takashi; and Nakagawa, Yukio, to Ishida Scales Mfg. Co., Ltd. Combinatorial weighing method with pairs of scales and zero adjustment. 4,618,011, Cl. 177-1.000.
SASIB S.p.A.: *See*—
Manservisi, Renato, 4,617,783, Cl. 53-529.000.
Sassen, Heinrich, to Zahnradfabrik Altona-Elbe Hans Meyer GmbH & Co. KG. Shifting coupling. 4,618,046, Cl. 192-67.00P.
Saternus, Antoni; Miczek, Ludwik; and Bartnik, Mieczyslaw, to Zaklady Produkcji Urzadzen Mechanicznych im. Janka Krasickiego "Elwo"; and Biuro Studiow i Projektow Energetycznych "Energoprojekt". Method of producing a suspension of fly ash in water. 4,618,376, Cl. 134-26.000.
Sato, Akira: *See*—
Kajiwara, Tadashi; Sato, Akira; Tsurumaru, Shinobu; and Kumamoto, Kenichiro, 4,618,838, Cl. 333-33.000.
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, to Nippon Petrochemicals Company, Limited. Electrical insulating oil and oil-filled electrical appliances. 4,618,914, Cl. 361-315.000.
Sato, Hideo: *See*—
Kato, Kazuo; and Sato, Hideo, 4,618,814, Cl. 323-280.000.
Yuyama, Yasuaki; Nakano, Junji; Kondo, Shyunichi; Sato, Hideo; and Sawada, Kenichi, 4,618,553, Cl. 430-69.000.
Sato, Kunio, to Casio Computer Co., Ltd. Hybrid electronic musical instrument. 4,617,851, Cl. 84-1.190.
Sato, Noritada; Seki, Yasukazu; and Ishiwate, Osamu, to Fuji Electric Corporate Research and Development Ltd.; and Fuji Electric Company Ltd. Method for adding impurities to semiconductor base material. 4,618,381, Cl. 148-189.000.
Sato, Takashi; and Kubo, Emiko, to Fujizoki Pharmaceutical Co., Ltd. Reagent and merchandising kit for use in the diagnosis of syphilis and preparation thereof. 4,618,588, Cl. 436-511.000.
Sato, Yoshinari: *See*—
Teraji, Tsutomu; Shiokawa, Youichi; Okumura, Kazuo; and Sato, Yoshinari, 4,618,610, Cl. 514-242.000.

Satou, Morio: *See—*
Mashino, Keiichi; Satou, Morio; Masumoto, Shouji; Kobayashi, Kunio; and Miki, Osamu, 4,618,811, Cl. 322-28.000.

Sauer, Hans-Peter, to Bellheimer Metallwerk GmbH. Control device for at least two circulating shelving systems. 4,618,932, Cl. 364-478.000.

Saunders, Gerald A. B., to Queen's University at Kingston. Blade stiffener. 4,617,930, Cl. 128-317.000.

Sawada, Kenichi: *See—*
Yuyama, Yasuaki; Nakano, Junji; Kondo, Shyunichi; Sato, Hideo; and Sawada, Kenichi, 4,618,553, Cl. 430-69.000.

Sawamoto, Hirokazu: *See—*
Kayane, Yutaka; Miyamoto, Tetsuya; Omura, Takashi; Sawamoto, Hirokazu; Harada, Naoki; and Takeshita, Akira, 4,618,671, Cl. 534-635.000.

Sawitzki, Friedhelm: *See—*
Silber, Dieter; Sawitzki, Friedhelm; and Roy, Kurt, 4,618,781, Cl. 307-252.00C.

Say, Geoffrey R.: *See—*
Heinzelmann, Fred J.; Rothblatt, Noah S.; Glass, James P., Jr.; Say, Geoffrey R.; Chludzinski, George R.; Sartori, Guido; and Ho, W. S. Winston, 4,618,481, Cl. 423-228.000.

Sayama, Shigeharu: *See—*
Nagao, Tadasu; and Sayama, Shigeharu, 4,618,099, Cl. 239-332.000.

Sayo, Kosaku: *See—*
Fukushima, Toshihiko; Miyamoto, Seigo; Sayo, Kosaku; and Emi, Kenji, 4,617,804, Cl. 62-212.000.
Fukushima, Toshihiko; Miyamoto, Seigo; Fujita, Masahiko; Musoo, Masanori; and Sayo, Kosaku, 4,618,092, Cl. 236-92.00B.

Schaeffer, Richard J. Device for tightening chains and the like. 4,617,703, Cl. 24-68.0CT.

Schaffeler, Alois, to Marquardt GmbH. Electrical snap switch with double arm resetting lever. 4,618,747, Cl. 200-67.0PK.

Schaldach, Kurt. Bar puller. 4,617,847, Cl. 82-2.500.

Schapiro, Norman; and Moreau, Eugene J., to Resource Engineering Incorporated. Deashing process for coal. 4,618,346, Cl. 44-1.00A.

Scharf, Robert M.: *See—*
Beck, William R.; Jahn, William; Koltenback, Steven R.; Scharf, Robert M.; and Schwab, Ronald, 4,617,732, Cl. 29-866.000.

Scheffler, Gerhard; Niemeyer, Ulf; Brock, Norbert; and Pohl, Jorg, to Asta-Werke Aktiengesellschaft. 4-carbamoyloxy-oxazaphosphorins. 4,618,692, Cl. 558-81.000.

Schenck, Stephen R., to Texas Instruments Incorporated. Differential amplifier with improved power supply rejection ratio. 4,618,832, Cl. 330-254.000.

Schering Aktiengesellschaft: *See—*
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Mannesmann, Gerda; Nieuweboer, Bob; and Town, Michael-Harold, 4,618,626, Cl. 514-530.000.

Schieferstein, Ludwig: *See—*
Engelskirchen, Konrad; Stein, Werner; Bahn, Michael; Schieferstein, Ludwig; Schindler, Joachim; and Schmid, Rolf, 4,618,582, Cl. 435-104.000.

Schiller, Michael, to Fingermatrix, Inc. Matcher. 4,618,988, Cl. 382-5.000.

Schindler, Joachim: *See—*
Engelskirchen, Konrad; Stein, Werner; Bahn, Michael; Schieferstein, Ludwig; Schindler, Joachim; and Schmid, Rolf, 4,618,582, Cl. 435-104.000.

Schirmer, Ulrich: *See—*
Becker, Rainer; Jahn, Dieter; Schirmer, Ulrich; Schott, Eberhard P.; Hesse, Bernhard; and Jung, Johann, 4,618,362, Cl. 71-88.000.

Schlecker, Rainer; Schmidt, Peter; Thieme, Peter C.; Lenke, Dieter; Teschendorf, Hans-Jurgen; Traut, Martin; Mueller, Claus D.; Hofmann, Hans P.; and Kreiskott, Horst, to BASF Aktiengesellschaft. Sulfonates of hydroxycoumarins. 4,618,622, Cl. 514-457.000.

Schleien, Mickey M.: *See—*
Hudson, John O.; Schleien, Mickey M.; and Barrett, John, 4,618,444, Cl. 252-92.000.

Schlensog, Klaus: *See—*
Beer, Christian; Riedweg, Robert; and Schlensog, Klaus, 4,617,912, Cl. 128-1.00B.

Schmid, Rolf: *See—*
Engelskirchen, Konrad; Stein, Werner; Bahn, Michael; Schieferstein, Ludwig; Schindler, Joachim; and Schmid, Rolf, 4,618,582, Cl. 435-104.000.

Schmidt, Helmut; Bodenmiller, Anton; and Straka, Alfred, to Kaltenbach & Voigt GmbH & Co. Equipment stand for dental implements. 4,618,326, Cl. 433-79.000.

Schmidt, Paul J.; and Hung, William M., to Hilton-Davis Chemical Co., The. Substituted indoles. 4,618,684, Cl. 548-455.000.

Schmidt, Peter: *See—*
Schlecker, Rainer; Schmidt, Peter; Thieme, Peter C.; Lenke, Dieter; Teschendorf, Hans-Jurgen; Traut, Martin; Mueller, Claus D.; Hofmann, Hans P.; and Kreiskott, Horst, 4,618,622, Cl. 514-457.000.

Schmidtchen, Hans-Martin; and Voigt, Hermann U., to Kabel-und Metallwerke Gutehoffnungshuette. Base material for silane grafted, crosslinked thermoplastic or elastomeric material. 4,618,654, Cl. 525-288.000.

Schmidtpott, Friedrich: *See—*
Freyberger, Laurin C.; Mlynek, Daniel; and Schmidtpott, Friedrich, 4,618,881, Cl. 358-27.000.

Schmitt, Gerd: *See—*
Nestlen, Wolfgang; and Schmitt, Gerd, 4,618,842, Cl. 335-128.000.

Schmitt, Walter, to Dr. Johannes Heidenhain GmbH. Error correction system for digital length or angle measuring instrument. 4,618,940, Cl. 364-560.000.

Schmitz, Charles E., to Grumman Aerospace Corporation. Infrared focal plane module with stacked IC module body. 4,618,763, Cl. 250-211.00R.

Schneider, Manfred; and Laumen, Kurt, to Bayer Aktiengesellschaft. Process for the preparation of (1S, 4R)-4-hydroxy-2-cyclopentenyl esters. 4,618,690, Cl. 556-441.000.

Schnoeller, Manfred: *See—*
Mohaupt, Jutta; Lubitz, Karl; Schnoeller, Manfred; and Wersing, Wolfram, 4,617,707, Cl. 29-25.350.

Schoenfelder, George A.; Siegel, Stephen L.; and Slater, James S., to Pittway Corporation. Outer electrode with improved smoke entry. 4,618,777, Cl. 250-381.000.

Schoenherr, Christine J., to Dow Corning Corporation. Silicone water-based caulking material. 4,618,642, Cl. 524-425.000.

Scholl, Hans-Joachim; and Hettel, Hans, to Bayer Aktiengesellschaft. Process for the preparation of aromatic polyisocyanates containing urea and/or biuret groups. 4,618,706, Cl. 560-335.000.

Schott, Eberhard P.: *See—*
Becker, Rainer; Jahn, Dieter; Schirmer, Ulrich; Schott, Eberhard P.; Hesse, Bernhard; and Jung, Johann, 4,618,362, Cl. 71-88.000.

Schrank, Martin P., to GTE Products Corporation. Hermetically sealed enclosure for thin film devices. 4,618,802, Cl. 313-512.000.

Schroder, Friedhelm: *See—*
Stapel, Gunter; Gober, Karl-Heinz; Leyck, Sigurd; Wetzig, Helmut; Birkner, Christian; Kesselring, Kurt; Christ, Bruno; Steiner, Klaus; and Schroder, Friedhelm, 4,618,605, Cl. 514-177.000.

Schubert, Dietmar: *See—*
Bilharz, Manfred; Heider, Peter; Roper, Hartmut; Taal, Martin; Henken, Fritz; Kohl, Ernst; and Schubert, Dietmar, 4,618,123, Cl. 251-28.000.

Schultz, Robert F. Automatic latching mechanism for overhead doors. 4,618,177, Cl. 292-338.000.

Schultz, William J.: *See—*
Pittman, Raymond H.; and Schultz, William J., 4,617,774, Cl. 52-521.000.

Schultze, Hartmut: *See—*
Donner, Bernd; Schultze, Hartmut; and Jahnig, Lutz, 4,617,893, Cl. 123-361.000.

Schumacher, Ignatius, to Monsanto Company. Vapor phase nitration of aromatic compounds. 4,618,733, Cl. 568-927.000.

Schuster, Hans-Dieter: *See—*
Abthoff, Jorg; Schuster, Hans-Dieter; Loose, Gunter; and Ebinger, Gunther, 4,617,795, Cl. 60-276.000.

Schuster, Hubert: *See—*
Burger, Hans-Joachim; and Schuster, Hubert, 4,618,467, Cl. 264-46.600.

Schuster, Stanley E.: *See—*
Chappell, Barbara A.; Rajeevakumar, Thekkemadathil V.; Schuster, Stanley E.; and Terman, Lewis M., 4,618,784, Cl. 307-449.000.

Schuster, Wilhelm: *See—*
Gloria, Karl F. L.; Costinescu-Tataranu, Alexandru B.; Schuster, Wilhelm; and Wittekind, Jurgen, 4,618,282, Cl. 405-53.000.

Schutram, David P.: *See—*
Dale, Steven M.; Lyon, Richard A.; and Schutram, David P., 4,618,198, Cl. 339-60.00M.

Schutten, Herman P.: *See—*
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,618,971, Cl. 378-34.000.

Schwab, Ronald: *See—*
Beck, William R.; Jahn, William; Koltenback, Steven R.; Scharf, Robert M.; and Schwab, Ronald, 4,617,732, Cl. 29-866.000.

Schwaderer, John R.; and Kristof, Mark J., to Whirlpool Corporation. Air circulation system for microwave oven. 4,618,756, Cl. 219-10.55R.

Schwan, Eduard A.: *See—*
Maxwell, Duane S.; Phillips, Roger; and Schwan, Eduard A., 4,618,965, Cl. 375-10.000.

Schwartz, Arnold, to Perkin-Elmer Corporation, The. Liquid chromatography controller. 4,618,935, Cl. 364-510.000.

Schwartz, Jean-Charles: *See—*
Roques, Bernard; Schwartz, Jean-Charles; and Lecomte, Jeanne-Marie, 4,618,708, Cl. 562-448.000.

Schwebel, Adolf: *See—*
Greiner, Harry; and Schwebel, Adolf, 4,618,135, Cl. 271-9.000.

Schwerdt, Paul: *See—*
Weiger, Gunter; Dorrie, Dieter; and Schwerdt, Paul, 4,617,969, Cl. 137-627.500.

Schwind, Herbert: *See—*
Baron, Heinz; Hoefer, Peter; and Schwind, Herbert, 4,618,228, Cl. 351-161.000.

Schwob, Pierre; and Dimey, Marcel, to SEB S.A. Ball actuated position sensitive switch. 4,618,746, Cl. 200-61.45R.

SCM Corporation: *See—*
DePasquale, Ralph J.; Evans, James M.; and Kremer, Paul W., 4,618,688, Cl. 556-419.000.

Scott, Norman R.: *See—*
Gettens, John W.; Sigrimis, Nick A.; and Scott, Norman R., 4,618,861, Cl. 340-825.540.

Sealed Power Corporation: *See—*
Hendrixon, John, 4,617,968, Cl. 137-625.640.

Seat, Bobby G. Exhaust flue heat exchange device. 4,617,989, Cl. 165-145.000.
SEB S.A.: *See—*
Schwob, Pierre; and Dimey, Marcel, 4,618,746, Cl. 200-61.45R.
Sebastian, Verne D. Lawn mower leaf mulching blade and method. 4,617,788, Cl. 56-295.000.
Security & Auto Electrical Designs Ltd.: *See—*
Rogers, Peter G., 4,617,812, Cl. 70-218.000.
Sedillot, Francois G.: *See—*
Michel, Dominique; Johnson, Delbert B.; Pages, Jean F.; Foglia, Vincent F. P.; Martin, Jean G. M.; Vache , Michel P.; Sedillot, Francois G.; and Crull, Carroll M., 4,618,286, Cl. 405-208.000.
Seeler, C. Oliver. Thermally actuated immobilizing structure. 4,617,921, Cl. 128-89.00R.
Seelig, Stanley S., to Allied Corporation. Surfactant-based solvent system for dewatering different substrates. 4,618,447, Cl. 252-139.000.
Seesing, Johannes: *See—*
Volland, Robert; Freitag, Hans-Albrecht; Seesing, Johannes; and Bergmann, Herbert, 4,618,532, Cl. 428-304.400.
Segawa, Hiroyuki: *See—*
Fukushi, Yukihiro; and Segawa, Hiroyuki, 4,618,245, Cl. 355-14.0SH.
Seibt, Gunter: *See—*
Bohme, Klaus; Beyer, Wolfgang; Seibt, Gunter; and Digmayer, Michael, 4,618,749, Cl. 200-144.00B.
Seidel, William E.; Markunas, Albert L.; and Nelson, Thomas A., to Sundstrand Corporation. Control valve. 4,617,958, Cl. 137-492.500.
Seifert, Helmut; and Mondel, Karl, to REPA Feinstanzwerk GmbH. Deflection device for safety belts. 4,618,165, Cl. 280-808.000.
Seiko Epson Kabushiki Kaisha: *See—*
Suzawa, Osamu, 4,618,216, Cl. 350-345.000.
Seiko Seiki Kabushiki Kaisha: *See—*
Nagata, Tetsuya, 4,617,760, Cl. 51-34.00C.
Seki, Kouichi: *See—*
Sasano, Akira; Seki, Kouichi; Yamamoto, Hideaki; Baji, Toru; and Tsukada, Toshihisa, 4,618,873, Cl. 357-23.700.
Seki, Yasukazu: *See—*
Sato, Noritada; Seki, Yasukazu; and Ishiwate, Osamu, 4,618,381, Cl. 148-189.000.
Sekiya, Shinji; and Ono, Takatoshi, to Disco Co., Ltd. Grinding wheel for flat plates. 4,617,766, Cl. 51-209.00R.
Senic, Charles L.: *See—*
Cooper, Glenn D.; Butler, John M., III; Morrison, Darrell R.; Senic, Charles L.; Nilsson, Lennart S.; and Rowe, Charles M., 4,618,795, Cl. 310-260.000.
Seniff, Dana W.: *See—*
Golicz, Roman M.; Seniff, Dana W.; Fogle, Ronald L.; and Huggins, Orville C., 4,617,784, Cl. 53-540.000.
Senter, Peter D.: *See—*
Blattler, Walter A.; Lambert, John M.; and Senter, Peter D., 4,618,492, Cl. 424-85.000.
SEQUENCE: *See—*
Rubenfeld, Viktor P., 4,618,061, Cl. 206-444.000.
Sera, Hidefumi: *See—*
Dan, Shigeyuki; Ishii, Kazuo; Kato, Eiichi; and Sera, Hidefumi, 4,618,557, Cl. 430-114.000.
Seres, Alex, to Incoe Corporation. Downrigger mounting. 4,617,752, Cl. 43-27.400.
Seybold, Gunther: *See—*
Iden, Rudiger; and Seybold, Gunther, 4,618,694, Cl. 558-416.000.
Seyfried, Christoph: *See—*
Hausberg, Hans-Heinrich; Bottcher, Henning; Gottschlich, Rudolf; Seyfried, Christoph; and Minck, Klaus-Otto, 4,618,614, Cl. 514-321.000.
SFE Technologies: *See—*
Cichanowski, Stanley W.; and Shaw, David G., 4,618,911, Cl. 361-308.000.
Shah, Vipin D.: *See—*
Tsay, Yuh-Geng; and Shah, Vipin D., 4,618,485, Cl. 424-1.100.
Shalson, Peter, to Braitrim (London) Limited. Garment hanger. 4,618,080, Cl. 223-95.000.
Shapira, Alex: *See—*
Shimoni, Yair; Gilad, Amir; and Shapira, Alex, 4,617,938, Cl. 128-708.000.
Sharp Kabushiki Kaisha: *See—*
Hatta, Koichi, 4,618,927, Cl. 364-410.000.
Ikoma, Keiichi; and Katayama, Syuji, 4,618,780, Cl. 307-130.000.
Iwai, Hiroji, 4,618,278, Cl. 400-568.000.
Kotani, Matahira; and Matsumoto, Masafumi, 4,618,869, Cl. 346-75.000.
Nishioka, Yoshiki; Hakaridani, Mitsuhiro; and Iwahashi, Hiroyuki, 4,618,983, Cl. 381-43.000.
Shiono, Fusahiro, 4,618,936, Cl. 364-513.500.
Tsuji, Masaru, 4,618,247, Cl. 355-14.0FU.
Yamagishi, Toshio, 4,618,242, Cl. 355-3.0FU.
Sharpe, Anthony K.; and Mabey, Peter J., to U.S. Philips Corporation. Digital data transmission system. 4,618,955, Cl. 371-37.000.
Shaw, Christopher G.; and Kramer, Ted J., to Boeing Company, The. Radiation modulating apparatus and method. 4,618,218, Cl. 350-363.000.
Shaw, David G.: *See—*
Cichanowski, Stanley W.; and Shaw, David G., 4,618,911, Cl. 361-308.000.
Shebanow, Michael C.: *See—*
Young, Mark S.; Drew, John; Shebanow, Michael C.; and Dujari, Vineet, 4,618,898, Cl. 360-51.000.
Shedrow, Sidney. Lens holder and carrier for safety masks. 4,618,225, Cl. 351-57.000.
Shell Offshore Inc.: *See—*
Ahlstone, Arthur G., 4,618,285, Cl. 405-191.000.
Shell Oil Company: *See—*
Langner, Carl G., 4,617,998, Cl. 166-345.000.
Lau, Hon Chung, 4,617,995, Cl. 166-272.000.
Richardson, Edwin A., 4,617,994, Cl. 166-250.000.
Siddoway, Mark A.; Salter, James A.; and Deschner, Robert P., 4,617,744, Cl. 34-168.000.
Wood, Donald L.; and Fried, Herbert E., 4,618,400, Cl. 162-5.000.
Sherman, Dan R. Acoustical ducting for speakers and enclosures. 4,618,025, Cl. 181-148.000.
Sherwood, Duane D.; and Conway, John J., to TRW Inc. Spacecraft structure for supporting an optical bench. 4,618,111, Cl. 244-158.00R.
Shibata, Isamu; and Kanmoto, Yoshiaki, to Ricoh Co., Ltd. Device for controlling the radiating output of a semiconductor laser. 4,618,958, Cl. 372-29.000.
Shibata, Shuichi: *See—*
Suda, Hiroyuki; Shibata, Shuichi; and Nakahara, Motohiro, 4,618,354, Cl. 65-2.000.
Shigemura, Yutaka: *See—*
Hisajima, Masahiko; Shigemura, Yutaka; Makiura, Yoshinori; and Ishito, Mitsuya, 4,618,252, Cl. 355-55.000.
Shiio, Isamu; Sugimoto, Shinichi; and Kawamura, Kazue, to Ajinomoto Company, Incorporated. Process for the production of L-tryptophan using sulfaguanidine-resistant microorganisms. 4,618,580, Cl. 435-108.000.
Shim-A-Line, Inc.: *See—*
Specktor, John; and Specktor, Gerald A., 4,618,162, Cl. 280-661.000.
Shimada, Sachio: *See—*
Wakashima, Yoshikazu; and Shimada, Sachio, 4,618,406, Cl. 204-181.100.
Shimadzu Corporation: *See—*
Okubo, Kunihiko, 4,618,260, Cl. 356-331.000.
Shimano Industrial Company Limited: *See—*
Nagano, Masashi, 4,618,332, Cl. 474-80.000.
Nagano, Masashi, 4,618,333, Cl. 474-80.000.
Nakajima, Hideki, 4,618,107, Cl. 242-84.21R.
Noda, Hideo, 4,618,106, Cl. 242-84.50R.
Shimazoe, Michitaka: *See—*
Takahashi, Yukio; Shimazoe, Michitaka; and Matsuoka, Yoshitaka, 4,618,844, Cl. 338-2.000.
Shimizu, Atsushi: *See—*
Ichikawa, Toshiji; and Shimizu, Atsushi, 4,617,941, Cl. 128-765.000.
Shimizu, Isao; and Yamada, Kazuji, to Hitachi, Ltd. Method of manufacturing semiconductor device having a pressure sensor. 4,618,397, Cl. 156-628.000.
Shimizu, Taku: *See—*
Shinoda, Naoharu; Tatani, Atsushi; Omoto, Setsuo; Okino, Susumu; and Shimizu, Taku, 4,618,482, Cl. 423-242.000.
Shimoda, Takashi; and Sasaki, Masami, to Sumitomo Electric Industries, Ltd. GaAs single crystal and preparation thereof. 4,618,396, Cl. 156-605.000.
Shimoni, Yair; Gilad, Amir; and Shapira, Alex. Method and system for distinguishing R-wave electrocardiograph signals for synchronizing purposes. 4,617,938, Cl. 128-708.000.
Shin-Etsu Chemical Co., Ltd.: *See—*
Takago, Toshio; Arai, Masatoshi; and Futatsumori, Koji, 4,618,646, Cl. 524-783.000.
Takahashi, Masaharu; and Fukushima, Motoo, 4,618,639, Cl. 524-262.000.
Shinko Denshi Company Limited: *See—*
Kobayashi, Masaaki, 4,618,014, Cl. 177-210.0FP.
Shinoda, Naoharu; Tatani, Atsushi; Omoto, Setsuo; Okino, Susumu; and Shimizu, Taku, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for controlling a concentration of slurry in wet flue gas desulfurization apparatus. 4,618,482, Cl. 423-242.000.
Shinohara, Emiko: *See—*
Ozawa, Yoichi; Kishimoto, Shinichi; Shinohara, Emiko; Takemoto, Tadashi; and Eguchi, Chikahiko, 4,618,695, Cl. 560-41.000.
Shintani, Yooichi: *See—*
Kubo, Kanji; Wada, Kenichi; and Shintani, Yooichi, 4,618,926, Cl. 364-200.000.
Shiokawa, Youichi: *See—*
Teraji, Tsutomu; Shiokawa, Youichi; Okumura, Kazuo; and Sato, Yoshinari, 4,618,610, Cl. 514-242.000.
Shiono, Fusahiro, to Sharp Kabushiki Kaisha. Synthetic speech speed control in an electronic cash register. 4,618,936, Cl. 364-513.500.
Shipley Company Inc.: *See—*
Hertlein, Walter G., 4,618,233, Cl. 354-20.000.
Shirahata, Kunikatsu: *See—*
Hashizume, Kazuko; Kase, Hiroshi; Kitamura, Shigeto; Iida, Takao; Shirahata, Kunikatsu; Omori, Kenji; and Shuto, Katsuichi, 4,618,613, Cl. 514-312.000.
Shirley, Ian M.: *See—*
Ballard, Denis G. H.; Moran, Kenneth T.; and Shirley, Ian M., 4,618,454, Cl. 252-500.000.
Shizuka, Masayuki; and Yamada, Shigeki, to Hitachi, Ltd. Rotor for alternators with molded slipring assembly. 4,618,793, Cl. 310-232.000.
Shohda, Yoshio: *See—*
Uemura, Seiichi; Hirose, Takao; Shohda, Yoshio; Sakamoto, Takayoshi; and Katoh, Kenji, 4,618,463, Cl. 264-29.200.
Shu, Winston R., to Mobil Oil Corporation. Immiscible oil recovery process. 4,617,996, Cl. 166-273.000.

Shuf-Kut, Inc.: *See*—
Huckaby, James E., 4,618,378, Cl. 148-9.600.

Shuto, Katsuichi: *See*—
Hashizume, Kazuko; Kase, Hiroshi; Kitamura, Shigeto; Iida, Takao; Shirahata, Kunikatsu; Omori, Kenji; and Shuto, Katsuichi, 4,618,613, Cl. 514-312.000.

Sibigtroth, James M., to Motorola, Inc. Output compare system and method automatically controlilng multiple outputs in a data processor. 4,618,968, Cl. 377-39.000.

Sibilia, John P.: *See*—
Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; Oltmann, Harold D.; and Chen, Shu P., 4,618,528, Cl. 428-216.000.

Siczek, Bernard W., to Fischer Imaging Corporation. Table positioner for radiographic device. 4,618,133, Cl. 269-323.000.

Siddoway, Mark A.; Salter, James A.; and Deschner, Robert P., to Shell Oil Company. Elongated slot dryer for wet particulate material. 4,617,744, Cl. 34-168.000.

Sieb, Lawrence E., Jr.; and Mliner, David G., to General Electric Company. Edge enhancement filtering for digital fluorography images. 4,618,990, Cl. 382-43.000.

Sieben, James A.: *See*—
Johnson, Ronald L.; and Sieben, James A., 4,618,897, Cl. 360-15.000.

Siegel, Stephen L.: *See*—
Schoenfelder, George A.; Siegel, Stephen L.; and Slater, James S., 4,618,777, Cl. 250-381.000.

Siegrist, Max: *See*—
Gubler, Erich; and Siegrist, Max, 4,618,700, Cl. 560-67.000.

Siemens Aktiengesellschaft: *See*—
Birk, Adalbert, 4,618,887, Cl. 358-112.000.
Burger, Hans-Joachim; and Schuster, Hubert, 4,618,467, Cl. 264-46.600.
Grassme, Ulrich; and Noske, Erich, 4,618,974, Cl. 378-40.000.
Haendle, Joerg, 4,618,976, Cl. 378-99.000.
Horn, Klaus, 4,618,818, Cl. 324-62.000.
Meisel, Michael; and Wiendl, Heinz, 4,618,923, Cl. 363-144.000.
Mitlehner, Heinz, 4,618,871, Cl. 357-15.000.
Mohaupt, Jutta; Lubitz, Karl; Schnoeller, Manfred; and Wersing, Wolfram, 4,617,707, Cl. 29-25.350.
Mueller, Manfred, 4,618,748, Cl. 200-144.00R.
Riha, Gerd, 4,618,841, Cl. 333-195.000.
Wiessner, Edgar; Harbauer, Werner; and Paul, Klaus-Dieter, 4,618,807, Cl. 318-280.000.
Zuckler, Karl, 4,618,750, Cl. 200-144.00B.

Siemens-Allis, Inc.: *See*—
Holter, Warren G.; and Van Laanen, Lawrence V., 4,617,725, Cl. 29-598.000.

Siemens Gammasonics, Inc.: *See*—
Haas, Werner J.; and Haerten, Rainer L., 4,618,772, Cl. 250-363.00S.
Persyk, Dennis E.; and Stoub, Everett W., 4,618,775, Cl. 250-369.000.

Sies, Helmut: *See*—
Dereu, Norbert; Welter, Andre ; Wendel, Albrecht; Leyck, Sigurd; Parnham, Michael; Graf, Erich; Sies, Helmut; Betzing, Hans; and Fischer, Hartmut, 4,618,669, Cl. 530-331.000.

Sievers, Otto H. Control means for ground hydrants. 4,617,956, Cl. 137-272.000.

Sigrimis, Nick A.: *See*—
Gettens, John W.; Sigrimis, Nick A.; and Scott, Norman R., 4,618,861, Cl. 340-825.540.

Silber, Dieter; Sawitzki, Friedhelm; and Roy, Kurt, to Licentia Patent-Verwaltungs-G.m.b.H. Gate turn-off thyristor construction. 4,618,781, Cl. 307-252.00C.

Silbernagel, Raymond A., to Molex Incorporated. Two piece modular receptacle. 4,618,207, Cl. 339-176.00M.

Silvenis, Scott A., to Dow Chemical Company, The. Dual dispensing bottle. 4,618,076, Cl. 222-331.000.

Silver, Paul J.: *See*—
Sulkowski, Theodore S.; Silver, Paul J.; and Mascitti, Albert A., 4,618,678, Cl. 546-123.000.

Silverberg, Morton, to Xerox Corporation. Plural belt document feeder. 4,618,138, Cl. 271-245.000.

Silverstein, Sidney, to Hunt X-ACTO, Inc. Safety cap. 4,617,735, Cl. 30-151.000.

Simko, Frank A., Jr. Thermal insulating material. 4,618,517, Cl. 428-36.000.

Simoneau, Edward T.: *See*—
Traver, Frank J.; and Simoneau, Edward T., 4,618,689, Cl. 556-425.000.

Simonton, Robert D.; Cattano, John D.; and Mason, Robert K., to Fremont Special Machine Co., Inc. Cell separator basket and method of forming same. 4,618,546, Cl. 429-133.000.

Simpson, Geoffrey M., to Haley & Weller Limited. Pyrotechnic or explosive device. 4,617,866, Cl. 102-262.000.

Sincotron APS: *See*—
Anderseu, Axel; and Bondergaard, Klaus, 4,617,728, Cl. 29-836.000.

Singh, Anand P., to NRM Corporation. Tire press and loader. 4,618,320, Cl. 425-38.000.

Singleton, Russell M.: *See*—
Sandland, Paul; Chadwick, Curt H.; Singleton, Russell M.; and Dwyer, Howard, 4,618,938, Cl. 364-552.000.

Sivov, Ferdo A., to Institute po Mebeli I Obzavejdane. Fluidic sensor of objects. 4,617,970, Cl. 137-805.000.

SKF Kugellagerfabriken GmbH: *See*—
Brandenstein, Manfred; Haas, Roland; Herrmann, Gerhard; Friedrich, Wolfgang; and Edelmann, Ludwig, 4,618,335, Cl. 474-112.000.

Skraba, Frank W., to Phillips Petroleum Company. Fractionation method and apparatus. 4,618,051, Cl. 196-139.000.

Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Mannesmann, Gerda; Nieuweboer, Bob; and Town, Michael-Harold, to Schering Aktiengesellschaft. Novel carbacyclin esters, process for the preparation thereof, and their use as medicinal agents. 4,618,626, Cl. 514-530.000.

Slater, James S.: *See*—
Schoenfelder, George A.; Siegel, Stephen L.; and Slater, James S., 4,618,777, Cl. 250-381.000.

Slater, William M.: *See*—
Fyfe, Edward R.; Slater, William M.; and Watson, Ronald J., 4,617,769, Cl. 52-167.000.

Smith, David A.; and Wells, Oliver C., to International Business Machines Corporation. Low-energy scanning transmission electron microscope. 4,618,767, Cl. 250-311.000.

Smith, Eugene A., to Northrop Corporation. System for transmitting a laser beam from one location on an aircraft externally to a remote receiver. 4,618,224, Cl. 350-618.000.

Smith, Gordon M., to Johnston Pump/General Valve, Inc. Tight shut-off valve with flow control. 4,617,964, Cl. 137-625.300.

Smith, Harry A.: *See*—
Bergman, Roger W.; and Smith, Harry A., 4,618,461, Cl. 558-234.000.

Smith International, Inc.: *See*—
Parks, Jimmy C., 4,618,465, Cl. 264-40.100.

Smith-Johannsen, Robert, to Ramu International. Oil-in-water suspensions as additives for cements. 4,618,369, Cl. 106-95.000.

Smith, Robert W., to General Telephone of Illinois. Freeze resistant gate latch. 4,618,175, Cl. 292-205.000.

Smith, Schuyler B.: *See*—
Braun, Joseph T.; and Smith, Schuyler B., 4,618,665, Cl. 528-25.000.

Smith, Stanford L.; Wang, Paul C.; and Coffey, Charles W., to U.K. Research Foundation. Quality control phantom for use in computed tomographic imaging instruments and method of use. 4,618,826, Cl. 324-308.000.

Smith, Thomas W.: *See*—
Stolka, Milan; Pai, Damodar M.; Smith, Thomas W.; Duff, James M.; and Loutfy, Rafik O., 4,618,551, Cl. 430-58.000.

SmithKline-RIT: *See*—
Delgoffe, Jean-Claude; Lobmann, Michele; and Zygraich, Nathan, 4,618,493, Cl. 424-89.000.

Smiths Industries Public Limited Company: *See*—
Bishop, David C., 4,618,994, Cl. 383-96.000.

Snider, Joel M.: *See*—
Cuthbert, Victor W.; and Snider, Joel M., 4,618,193, Cl. 312-264.000.

Snyder, Douglas D.: *See*—
Koch, Russell W.; and Snyder, Douglas D., 4,618,519, Cl. 428-63.000.

Sobukawa, Hideo: *See*—
Fujitani, Yoshiyasu; Muraki, Hideaki; Yokota, Koji; Sobukawa, Hideo; and Matsunaga, Shinichi, 4,617,794, Cl. 60-274.000.

Societe Anonyme des Ateliers Houget Duesberg Bosson: *See*—
Lousberg, Pierre, 4,617,791, Cl. 57-299.000.

Societe Nationale Elf Aquitaine (Production): *See*—
Levesque, Guy; and Tozzolino, Pierre, 4,618,416, Cl. 209-166.000.

Soled, Stuart L.: *See*—
Fiato, Rocco A.; and Soled, Stuart L., 4,618,597, Cl. 502-324.000.

Solex (U.K.) Limited: *See*—
Pagdin, Brian C., 4,617,904, Cl. 123-525.000.

Somekh, Sasson: *See*—
Maydan, Dan; Somekh, Sasson; and Kaczorowski, Edward M., 4,618,262, Cl. 356-357.000.

Sommer, Rudiger: *See*—
Pointner, Martin; and Sommer, Rudiger, 4,617,727, Cl. 29-825.000.

Sonne, Darrell S., to Halliburton Company. Gamma ray measurement of earth formation properties using a position sensitive scintillation detector. 4,618,765, Cl. 250-269.000.

Sonobe, Toshimitsu, to Thomas & Betts Corporation. Lead member and method of fixing thereof. 4,618,209, Cl. 339-258.00R.

Sony Corporation: *See*—
Kajiwara, Tadashi; Sato, Akira; Tsurumaru, Shinobu; and Kumamoto, Kenichiro, 4,618,838, Cl. 333-33.000.
Kori, Takuaki; Ozawa, Hirotaka; and Sugawara, Shiro, 4,617,714, Cl. 29-434.000.
Nakamura, Yukio, 4,618,843, Cl. 335-210.000.
Okamura, Kiyohito; Hasegawa, Yoshio; Kuroo, Yoshiyasu; and Ugaji, Masana, 4,618,591, Cl. 501-90.000.
Yamada, Hisafumi; Kurik, Choei; and Saito, Junya, 4,618,891, Cl. 358-153.000.

Sotoyama, Kaoru; Sumida, Shizuo; and Kikuchi, Toshiyuki, to Mazda Motor Corporation. Lock-up control system for a torque converter for an automatic transmission. 4,618,041, Cl. 192-0.044.

Southers California Edison: *See*—
Mansour, Mansour N., 4,618,323, Cl. 431-177.000.

Soyck, Gerno: *See*—
Dahlheimer, Peter; and Soyck, Gerno, 4,618,823, Cl. 324-207.000.

Spacesaver Corporation: *See*—
Peterman, Robert J., 4,618,191, Cl. 312-201.000.

Specktor, Gerald A.: *See*—
Specktor, John; and Specktor, Gerald A., 4,618,162, Cl. 280-661.000.
Specktor, John; and Specktor, Gerald A., to Shim-A-Line, Inc. Device and method for adjusting camber in a strut-type vehicle suspension. 4,618,162, Cl. 280-661.000.
Spellman, Gordon B.: *See*—
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,618,971, Cl. 378-34.000.
Sperry Corporation: *See*—
Lamensdorf, David; and Daigle, Chris J., 4,618,865, Cl. 343-776.000.
Martin, Hubert C., Jr., 4,618,919, Cl. 363-21.000.
Spoolstra, Gregg R., to General Motors Corporation. Electromagnetic unit fuel injector with port assist spilldown. 4,618,095, Cl. 239-90.000.
Spooner, Eric: *See*—
Rickett, Roger G.; and Spooner, Eric, 4,618,052, Cl. 198-370.000.
Sprayton Equipment Company: *See*—
Brown, Warren D., 4,618,294, Cl. 406-113.000.
Spruill, Howard T.; and Webster, Thelton A., to Stauffer Chemical Company. Heat recovery through oxidation of elemental phosphorus in a fluidized bed. 4,618,483, Cl. 423-304.000.
Square D Company: *See*—
Wehr, Eugene W.; Oster, Clark L.; and Evans, Terence J., 4,618,751, Cl. 200-144.00R.
Staerzl, Richard E., to Brunswick Corporation. Fuel-optimizing electronic control circuit for a fuel-injected marine engine or the like. 4,617,892, Cl. 123-352.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Process and apparatus for piecing a yarn at a spinning unit of an open-end friction spinning machine. 4,617,790, Cl. 57-263.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Air flow control arrangement for an open-end friction spinning machine. 4,617,792, Cl. 57-401.000.
Stahlecker, Fritz: *See*—
Gotz, Dieter; and Zott, Werner, 4,618,273, Cl. 384-606.000.
Stahlecker, Hans: *See*—
Gotz, Dieter; and Zott, Werner, 4,618,273, Cl. 384-606.000.
Stahlecker, Fritz, 4,617,790, Cl. 57-263.000.
Stahlecker, Fritz, 4,617,792, Cl. 57-401.000.
Stal Refrigeration AB: *See*—
Lindstrom, Paul, 4,618,272, Cl. 384-517.000.
Stanadyne, Inc.: *See*—
Hodgkins, David, 4,618,423, Cl. 210-305.000.
Standard Change-Makers, Inc.: *See*—
Bayne, Robert T.; and Heidelberger, James E., 4,618,257, Cl. 356-71.000.
Standard Oil Company, The: *See*—
Herrington, Daniel R.; and Kuch, Philip L., 4,618,723, Cl. 568-70.000.
Standard Oil Company (Indiana): *See*—
Tait, A. Martin; Nevitt, Thomas D.; and Hensley, Albert L., Jr., 4,618,594, Cl. 502-66.000.
Standard Telephones and Cables, plc: *See*—
Vance, Ian A. W.; and Neale, Michael W., 4,618,967, Cl. 375-80.000.
Stanton, Austin N.: *See*—
Salisbury, Winfield W., 4,618,470, Cl. 376-123.000.
Stapel, Gunter; Gober, Karl-Heinz; Leyck, Sigurd; Wetzig, Helmut; Birkner, Christian; Kesselring, Kurt; Christ, Bruno; Steiner, Klaus; and Schroder, Friedhelm. Process for the production of β-elemonic acid and pharmaceutical preparations containing said acid. 4,618,605, Cl. 514-177.000.
Stares, James A., to McGraw-Edison Company. Control valve with anticavitation trim. 4,617,963, Cl. 137-625.300.
Stashko, Daniel R.: *See*—
Allaire, Paul B.; and Stashko, Daniel R., 4,618,296, Cl. 407-42.000.
Staudenmayer, William J.: *See*—
Borsenberger, Paul M.; Regan, Michael T.; and Staudenmayer, William J., 4,618,560, Cl. 430-130.000.
Stauffer Chemical Company: *See*—
Bay, W. Elliot; and Reineke, Karl E., 4,618,719, Cl. 568-17.000.
Bay, W. Elliott; Reineke, Karl E.; and Weil, Edward D., 4,618,720, Cl. 568-17.000.
Kuck, Mark A.; and Gersten, Susan W., 4,618,345, Cl. 23-293.00R.
Spruill, Howard T.; and Webster, Thelton A., 4,618,483, Cl. 423-304.000.
Steele, Dennis L.: *See*—
Berman, Jody R.; Steele, Dennis L.; and Kubisiak, Michael P., 4,618,526, Cl. 428-209.000.
Steensgaard, Jens: *See*—
Jefferis, Royston; and Steensgaard, Jens, 4,618,589, Cl. 436-540.000.
Steffen, Frank: *See*—
Steinke, Gerhard; Fels, Peter; Hoeg, Wolfgang; Lorenz, Werner; Ahnert, Wolfgang; Steffen, Frank; and Reichardt, Walter, 4,618,987, Cl. 381-82.000.
Stein Industrie: *See*—
Franzolini, Marc; Maria, Edmond; Vanderschaeghe, Alain; and Bezier, Jean, 4,617,990, Cl. 165-173.000.
Stein, Werner: *See*—
Engelskirchen, Konrad; Stein, Werner; Bahn, Michael; Schieferstein, Ludwig; Schindler, Joachim; and Schmid, Rolf, 4,618,582, Cl. 435-104.000.
Steinbach, Robert L.: *See*—
Christopher, Walter S.; Kriskovich, Robert T.; and Steinbach, Robert L., 4,617,813, Cl. 70-394.000.
Steinberg, David H.; Luzzi, John J.; and Cortolano, Frank P., to Ciba-Geigy Corporation. Substituted 4-hydroxybenzylthio aldehyde and ketone stabilizers. 4,618,440, Cl. 252-48.200.
Steiner, Klaus: *See*—
Stapel, Gunter; Gober, Karl-Heinz; Leyck, Sigurd; Wetzig, Helmut; Birkner, Christian; Kesselring, Kurt; Christ, Bruno; Steiner, Klaus; and Schroder, Friedhelm, 4,618,605, Cl. 514-177.000.
Steiner, Paul R.: *See*—
Miller, Joseph M.; Fannin, Stephen W.; and Steiner, Paul R., 4,618,929, Cl. 364-415.000.
Steinke, Gerhard; Fels, Peter; Hoeg, Wolfgang; Lorenz, Werner; Ahnert, Wolfgang; Steffen, Frank; and Reichardt, Walter, to Deutsche Post, Rundfunk-und Fernsehtechnisches Zentralamt. Large-area acoustic radiation system. 4,618,987, Cl. 381-82.000.
Stellana Plast AB: *See*—
Arneteg, Ingemar, 4,617,867, Cl. 105-154.000.
Stenkvist, Sven-Einar: *See*—
Rappinger, Bo; and Stenkvist, Sven-Einar, 4,618,963, Cl. 373-72.000.
Stepp, Elvin D.; and Claypoole, Gary L., to Cincinnati Electronics Corporation. Frequency shift key modulator. 4,618,966, Cl. 375-62.000.
Stetson, John R., to Congoleum Corporation. Process for the preparation of a composite mat. 4,618,530, Cl. 428-236.000.
Steuck, Michael J., to Millipore Corporation. Porous membrane having hydrophilic surface and process. 4,618,533, Cl. 428-315.700.
Steuer, Herbert K.: *See*—
Rattunde, Manfred; Steuer, Herbert K.; and Wolf, Hans-Jurgen, 4,618,338, Cl. 474-245.000.
Stewart, Roger G.; and Ipri, Alfred C., to RCA Corporation. Electrically alterable, nonvolatile floating gate memory device. 4,618,876, Cl. 357-54.000.
Stockinger, Friedrich; Lohse, Friedrich; and Moser, Roland, to Ciba-Geigy Corporation. N-cyanocarboxylic acid amides, processes for their preparation and their use. 4,618,712, Cl. 564-103.000.
Stolka, Milan; Pai, Damodar M.; Smith, Thomas W.; Duff, James M.; and Loutfy, Rafik O., to Xerox Corporation. Photoresponsive imaging members with polysilylenes hole transporting compositions. 4,618,551, Cl. 430-58.000.
Stopa, Peter: *See*—
Rosenstein, Robert; Aspden, Kim P.; and Stopa, Peter, 4,618,576, Cl. 435-7.000.
Storage Technology Partners: *See*—
Wiscombe, Nathan, 4,618,779, Cl. 307-60.000.
Storz, Werner, to Sueddeutsche Kuehlerfabrik, Julius Fr. Behr GmbH & Co. KG. Fluid friction clutch. 4,618,045, Cl. 192-58.00B.
Stoub, Everett W.: *See*—
Persyk, Dennis E.; and Stoub, Everett W., 4,618,775, Cl. 250-369.000.
Straka, Alfred: *See*—
Schmidt, Helmut; Bodenmiller, Anton; and Straka, Alfred, 4,618,326, Cl. 433-79.000.
Strange, Thomas F.; and Carino, John W., to North American Philips Corporation. Electrical circuit interrupter for dry metallized film capacitors. 4,618,910, Cl. 361-275.000.
Street Specialty Products Inc: *See*—
Streett, James T., 4,617,712, Cl. 29-402.080.
Streett, James T., to Street Specialty Products Inc. Method for replacing Corvette door hinge spring. 4,617,712, Cl. 29-402.080.
Studio Tecnico A.C. s.r.l.: *See*—
Cortellucci, Giancarlo, 4,618,090, Cl. 229-45.00R.
Studwell, Kevin A. R., to Australian Design Marketing Pty. Ltd. Cladding element. 4,617,773, Cl. 52-537.000.
Sturm, Walter; Becker, Helmut; Witt, Jurgen; Fritz, Werner; and Eysholdt, Ursula, to W. C. Heraeus GmbH. Light and weather resistance sensing system with a sensed signal transmission channel. 4,618,776, Cl. 250-372.000.
Su, Wei-Fang A., to Westinghouse Electric Corp. UV curable high tensile strength resin composition. 4,618,632, Cl. 522-43.000.
Suck, Catherine: *See*—
Chazot, Guy; and Suck, Catherine, 4,618,601, Cl. 514-23.000.
Suda, Hiroyuki; Shibata, Shuichi; and Nakahara, Motohiro, to Nippon Telegraph & Telephone Public Corporation. Method, apparatus and burner for fabricating an optical fiber preform. 4,618,354, Cl. 65-2.000.
Suda, Yasuo: *See*—
Akashi, Akira; Ishizaki, Akira; Hiramatsu, Akira; Suda, Yasuo; and Ohtaka, Keiji, 4,618,236, Cl. 354-406.000.
Suddeutsche Zucker-Aktiengesellschaft: *See*—
Lichtenthaler, Frieder W.; and Klimesch, Roger G., 4,618,675, Cl. 536-17.200.
Sueddeutsche Kuehlerfabrik, Julius Fr. Behr GmbH & Co. KG: *See*—
Storz, Werner, 4,618,045, Cl. 192-58.00B.
Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Hydraulic control system for automatic transmission with shockless 4-2 shifting. 4,617,841, Cl. 74-869.000.
Sugawara, Shiro: *See*—
Kori, Takuaki; Ozawa, Hirotaka; and Sugawara, Shiro, 4,617,714, Cl. 29-434.000.
Sugimoto, Kenichi: *See*—
Yamaguchi, Keizaburo; Sugimoto, Kenichi; Tanabe, Yoshimitsu; Kawashima, Saburo; and Yamaguchi, Akihiro, 4,618,714, Cl. 564-329.000.

Sugimoto, Shinichi: *See*—
Shiio, Isamu; Sugimoto, Shinichi; and Kawamura, Kazue, 4,618,580, Cl. 435-108.000.

Sugiura, Muneharu; Fujibayashi, Kazuo; and Tsuji, Sadahiko, to Canon Kabushiki Kaisha. Zoom lens. 4,618,219, Cl. 350-427.000.

Sugizaki, Masuo: *See*—
Ohe, Junya; Wakita, Saburo; Yamatsuta, Kiichi; Goto, Shoji; Kutsukake, Yukinori; and Sugizaki, Masuo, 4,618,474, Cl. 420-436.000.

Suhre, Robert B., to Theradyne Corporation. Wheelchair with posture supports. 4,617,919, Cl. 128-78.000.

Sukenari, Junzo: *See*—
Eguchi, Jutaro; Odahara, Tetsuichi; and Sukenari, Junzo, 4,617,787, Cl. 56-14.600.

Sulkowski, Theodore S.; Silver, Paul J.; and Mascitti, Albert A., to American Home Products Corporation. 4-(2,3-dichloro-6-fluorophenyl)-1,4,5,6,7,8-hexahydro-2-methyl-5-oxo-1,7-naphthyridine-3-carboxylic acid 2-(2,3-dichlorophenoxy)ethyl ester. 4,618,678, Cl. 546-123.000.

Sullivan, Donald F. High resolution liquid photopolymer coating patterns over irregular printed wiring board surface conductors. 4,618,567, Cl. 430-311.000.

Sullivan, Jack M.: *See*—
Medina, Ramiro; and Sullivan, Jack M., 4,618,691, Cl. 558-80.000.

Sumida, Shizuo: *See*—
Sotoyama, Kaoru; Sumida, Shizuo; and Kikuchi, Toshiyuki, 4,618,041, Cl. 192-0.044.

Sumino, Fumio: *See*—
Tanaka, Shigemori; Sumino, Fumio; and Toma, Hitoshi, 4,618,552, Cl. 430-60.000.

Sumitomo Chemical Company, Limited: *See*—
Ishiguri, Yukio; Takano, Hirotaka; and Funaki, Yuji, 4,618,620, Cl. 514-383.000.
Kayane, Yutaka; Miyamoto, Tetsuya; Omura, Takashi; Sawamoto, Hirokazu; Harada, Naoki; and Takeshita, Akira, 4,618,671, Cl. 534-635.000.
Sada, Masao; Kato, Michio; Ayano, Masami; Abe, Tadashi; and Moriwaki, Masanori, 4,618,709, Cl. 562-532.000.
Yamamoto, Michihiro, 4,618,617, Cl. 514-364.000.

Sumitomo Electric Industries, Ltd.: *See*—
Shimoda, Takashi; and Sasaki, Masami, 4,618,396, Cl. 156-605.000.

Sumiya, Koji: *See*—
Ogasawara, Tsunehiko; Arakawa, Yoshichika; Sumiya, Koji; and Sakaguchi, Yoshikazu, 4,618,038, Cl. 192-3.290.

Sun Refining and Marketing Company: *See*—
Duggan, D. Michael; Lyons, James E.; and Myers, Harry K., Jr., 4,618,729, Cl. 568-678.000.

Sundstrand Corporation: *See*—
Seidel, William E.; Markunas, Albert L.; and Nelson, Thomas A., 4,617,958. Cl. 137-492.500.
Williams, Keith R., 4,617,797, Cl. 60-444.000.

Suter Company, Inc., The: *See*—
Blackman, Kent G., 4,617,778, Cl. 53-391.000.

Sutter, Leroy V., Jr. Configuration of electrodes for transversely excited gas lasers. 4,618,961, Cl. 372-87.000.

Sutton, A. Gunilla. Depilation device and method. 4,617,926, Cl. 128-303.100.

Suzawa, Osamu, to Seiko Epson Kabushiki Kaisha. Backlighted liquid crystal display using light passage member for more nearly uniform illumination. 4,618,216, Cl. 350-345.000.

Suzuki, Koji: *See*—
Nagashima, Nao; Suzuki, Koji; Nagahira, Jyoji; Kuroda, Kouki; and Takayanagi, Yoshiaki, 4,618,246, Cl. 355-14.00R.
Tokuyama, Shunji; Suzuki, Koji; and Arimatsu, Keiji, 4,618,905, Cl. 361-4.000.

Suzuki, Masaaki: *See*—
Oishi, Kengo; and Suzuki, Masaaki, 4,618,903, Cl. 360-132.000.

Suzuki, Nobuyuki; Tanaka, Kenichi; and Yamanashi, Masanao, to Nikkei Kako Kabushiki Kaisha; and Nippon Light Metal Company Limited. Method for manufacture of cast articles of fiber-reinforced aluminum composite. 4,617,979, Cl. 164-97.000.

Suzuki, Shoichi; and Keiichi, Yamada, to Diesel Kiki Co., Ltd. Exhaust-gas particle treating device for internal combustion engine. 4,617,793, Cl. 60-285.000.

Suzuki, Tetsumi; Murayama, Tetsuo; Ono, Hitoshi; Aramaki, Shinji; and Yokoyama, Michiyo, to Mitsubishi Chemical Ind., Ltd. Electrophotographic photoreceptor comprising azo compounds. 4,618,555, Cl. 430-78.000.

Suzuki, Tsunefusa: *See*—
Ohashi, Tamaki; Suzuki, Tsunefusa; Nakada, Kaoru; Hoshi, Nobuya; Fujimura, Hisao; and Ui, Hiromitu, 4,617,831, Cl. 74-10.330.

Swanson, Alfred B. Child safety restraint. 4,618,186, Cl. 297-468.000.

Swanson, Eric J., to AT&T Bell Laboratories. Mixed threshold current mirror. 4,618,815, Cl. 323-315.000.

Swift, Stephen D.: *See*—
Garman, James A.; Swift, Stephen D.; Livesay, Richard E.; and Arians, Arlyn J., 4,618,190, Cl. 305-39.000.

Swiss Aluminium Ltd.: *See*—
Banninger, Urs, 4,617,980, Cl. 164-430.000.

Switall, Thomas G., to Ryco Graphic Manufacturing, Inc. Liquid coater for a printing press with moveable inking roller and tray. 4,617,865, Cl. 101-350.000.

Swoboda, Johann: *See*—
Muench, Volker; Hambrecht, Juergen; Himmele, Walter; Echte, Adolf; and Swoboda, Johann, 4,618,668, Cl. 528-215.000.

SWS Silicones Corporation: *See*—
Agodoa, Michael K., 4,618,389, Cl. 156-307.500.

Syntex (U.S.A.) Inc.: *See*—
Cooper, Gary F.; Edwards, John A.; and Van Horn, Albert R., 4,618,696, Cl. 560-53.000.

Szabo, Miklos: *See*—
Batorfalvi, Geza; Lendvai, Tibor; Radai, Antal; Pongrac, Gaborne ; Szabo, Miklos; and Szilardi, Jeno , 4,617,700, Cl. 17-45.000.

Szilardi, Jeno : *See*—
Batorfalvi, Geza; Lendvai, Tibor; Radai, Antal; Pongrac, Gaborne ; Szabo, Miklos; and Szilardi, Jeno , 4,617,700, Cl. 17-45.000.

Szonyi, Gabor: *See*—
Pal, Gabor; Endroczi, Gabor; Hollos, Gyorgy; Nagy, Gabor; Szonyi, Gabor; Bodi Laszlo ; and Balazs, Zoltan, 4,617,830, Cl. 73-590.000.

Szporny, Laszlo : *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,618,611, Cl. 514-255.000.

T. J. Gundlach Machine Company: *See*—
Gundlach, Theodore F., 4,617,709, Cl. 29-124.000.

Taal, Martin: *See*—
Bilharz, Manfred; Heider, Peter; Roper, Hartmut; Taal, Martin; Henken, Fritz; Kohl, Ernst; and Schubert, Dietmar, 4,618,123, Cl. 251-28.000.

Tabak, Samuel A.: *See*—
Chester, Arthur W.; Garwood, William E.; and Tabak, Samuel A., 4,618,737, Cl. 585-329.000.

Tabata, Kuniaki; and Takeda, Haruo, to Hitachi, Ltd. Processing method for the rotation of an image. 4,618,991, Cl. 382-46.000.

Taga, Yukio, to Nippon Notion Kogyo Co., Ltd. Mechanism for delivering fastener elements to fastener-assembling apparatus. 4,618,053, Cl. 198-389.000.

Tago, Keiichiro, to Fuji Electric Co., Ltd. Mechanical displacement transducer. 4,618,862, Cl. 340-870.370.

Tait, A. Martin; Nevitt, Thomas D.; and Hensley, Albert L., Jr., to Standard Oil Company (Indiana). Catalyst and process for the hydrodenitrogenation and hydrocracking of high-nitrogen feeds. 4,618,594, Cl. 502-66.000.

Takada, Masahiko: *See*—
Ogawa, Takahiro; Takada, Masahiko; Matsumoto, Takaharu; and Kanbara, Youichi, 4,618,469, Cl. 264-182.000.

Takada, Shunji: *See*—
Mihayashi, Keiji; Kobayashi, Hidetoshi; and Takada, Shunji, 4,618,572, Cl. 430-543.000.

Takago, Toshio; Arai, Masatoshi; and Futatsumori, Koji, to Shin-Etsu Chemical Co., Ltd. Room temperature-curable organopolysiloxane composition. 4,618,646, Cl. 524-783.000.

Takahashi, Makoto: *See*—
Yokoyama, Meiso; Takahashi, Makoto; Nishiwaki, Tsunehiko; and Imai, Makoto, 4,617,821, Cl. 73-23.000.

Takahashi, Masaharu; and Fukushima, Motoo, to Shin-Etsu Chemical Co., Ltd. Antistatic organopolysiloxane composition. 4,618,639, Cl. 524-262.000.

Takahashi, Yukio; Shimazoe, Michitaka; and Matsuoka, Yoshitaka, to Hitachi, Ltd. Semiconductor pressure transducer. 4,618,844, Cl. 338-2.000.

Takahira, Yoshiyuki: *See*—
Morioka, Akira; Matsuura, Takeshi; and Takahira, Yoshiyuki, 4,618,536, Cl. 428-329.000.

Takamiya, Shigeo; Inoue, Kazutoshi; and Tsutaya, Kenzo, to Mitsui Kensetsu Kabushiki Kaisha. Method for constructing an enlarged tunnel and apparatus for forming the same. 4,618,298, Cl. 405-150.000.

Takanashi, Hajime: *See*—
Kuramoto, Shinichi; and Takanashi, Hajime, 4,618,558, Cl. 430-115.000.

Takano, Hirotaka: *See*—
Ishiguri, Yukio; Takano, Hirotaka; and Funaki, Yuji, 4,618,620, Cl. 514-383.000.

Takano, Katsuhiko; Iijima, Shigeharu; Yoshihara, Satoshi; Matsushima, Masaaki; Kishi, Hiroyoshi; and Sasamori, Eizo, to Canon Kabushiki Kaisha. Recording medium. 4,618,537, Cl. 428-336.000.

Takanoo, Miyako: *See*—
Kawakubo, Fumio; Takanoo, Miyako; Yukimoto, Sadao; and Isayama, Katsuhiko, 4,618,653, Cl. 525-404.000.
Kawakubo, Fumio; Takanoo, Miyako; Yukimoto, Sadao; and Isayama, Katsuhiko, 4,618,656, Cl. 525-404.000.

Takaoka, Tokuro: *See*—
Toshimitsu, Yoshihiko; Takaoka, Tokuro; Kawai, Toshitake; and Ishida, Takashi, 4,618,018, Cl. 180-142.000.

Takayanagi, Yoshiaki: *See*—
Nagashima, Nao; Suzuki, Koji; Nagahira, Jyoji; Kuroda, Kouki; and Takayanagi, Yoshiaki, 4,618,246, Cl. 355-14.00R.

Takeda, Haruo: *See*—
Tabata, Kuniaki; and Takeda, Haruo, 4,618,991, Cl. 382-46.000.

Takeda, Hisao; and Taniguchi, Yasunori, to American Colloid Company. Production process for highly water absorbable polymer. 4,618,631, Cl. 521-109.100.

Takeda, Kenji: *See*—
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,618,606, Cl. 514-202.000.

Takeda, Shigefumi: *See*—
Okuda, Hiromichi; Masuno, Hiroshi; Aburada, Masaki; Takeda, Shigefumi; Itoh, Eiko; Matsushita, Moe; and Hosoya, Eikichi, 4,618,495, Cl. 424-195.100.

Takemoto, Tadashi: *See*—
Ozawa, Yoichi; Kishimoto, Shinichi; Shinohara, Emiko; Takemoto, Tadashi; and Eguchi, Chikahiko, 4,618,695, Cl. 560-41.000.

Takenaka Engineering Co., Ltd.: *See*—
Miyake, Ryota; and Makino, Masami, 4,618,854, Cl. 340-567.000.

Takenouchi, Masanori, to Canon Kabushiki Kaisha. Developer and developing method. 4,618,556, Cl. 430-110.000.

Takeshita, Akira: *See*—
Kayane, Yutaka; Miyamoto, Tetsuya; Omura, Takashi; Sawamoto, Hirokazu; Harada, Naoki; and Takeshita, Akira, 4,618,671, Cl. 534-635.000.

Takigawa, Toshimichi: *See*—
Sasano, Ryoichiro; Toyohara, Tsutomu; and Takigawa, Toshimichi, 4,617,845, Cl. 82-1.00C.

Tamamura, Shoji: *See*—
Tanimura, Akira; Tsubata, Hisayasu; and Tamamura, Shoji, 4,617,982, Cl. 164-463.000.
Tsubata, Hisayasu; Tamamura, Shoji; and Tanimura, Akira, 4,617,983, Cl. 164-463.000.

Tamoto, Koji: *See*—
Okamura, Hisashi; Kobayashi, Hidetoshi; Nishikawa, Toshihiro; and Tamoto, Koji, 4,618,573, Cl. 430-558.000.

Tamura, Shinichi: *See*—
Ohashi, Masato; Kashioka, Motohiko; Tamura, Shinichi; Katsura, Hiromitsu; Ueda, Hideaki; and Nakamura, Akihiro, 4,618,554, Cl. 430-78.000.

Tan, Tun S., to Hewlett Packard Company. Pre-passivated submicrometer gate electrodes for MESFET devices. 4,618,510, Cl. 427-89.000.

Tanabe, Yoshimitsu: *See*—
Yamaguchi, Keizaburo; Sugimoto, Kenichi; Tanabe, Yoshimitsu; Kawashima, Saburo; and Yamaguchi, Akihiro, 4,618,714, Cl. 564-329.000.

Tanaka, Fuminari: *See*—
Iida, Tetsuya; and Tanaka, Fuminari, 4,618,847, Cl. 340-347.0DA.

Tanaka, Hideki: *See*—
Isobe, Masahiro; Okazaki, Sumio; and Tanaka, Hideki, 4,618,336, Cl. 474-133.000.

Tanaka, Kenichi: *See*—
Suzuki, Nobuyuki; Tanaka, Kenichi; and Yamanashi, Masanao, 4,617,979, Cl. 164-97.000.

Tanaka, Shigemori; Sumino, Fumio; and Toma, Hitoshi, to Canon Kabushiki Kaisha. Light receiving member for electrophotography having roughened intermediate layer. 4,618,552, Cl. 430-60.000.

Tanaka, Toshiyuki: *See*—
Imazeki, Kazuyoshi; Tanaka, Toshiyuki; and Miyakoshi, Hiromichi, 4,618,997, Cl. 455-76.000.

Tandem Computers Incorporated: *See*—
Horst, Robert W., 4,618,956, Cl. 371-68.000.

Tang, Andrew H., to Upjohn Company, The. Method for treating medical conditions involving cerebral ischemia. 4,618,621, Cl. 514-408.000.

Tani, Hideo: *See*—
Hashimoto, Masahiro; and Tani, Hideo, 4,618,349, Cl. 51-298.000.

Taniguchi, Hitofumi: *See*—
Kuramoto, Nobuyuki; and Taniguchi, Hitofumi, 4,618,592, Cl. 501-96.000.

Taniguchi, Yasunori: *See*—
Takeda, Hisao; and Taniguchi, Yasunori, 4,618,631, Cl. 521-109.100.

Tanimura, Akira; Tsubata, Hisayasu; and Tamamura, Shoji, to Unitika Ltd. Method of and apparatus for continuously manufacturing metal products. 4,617,982, Cl. 164-463.000.

Tanimura, Akira: *See*—
Tsubata, Hisayasu; Tamamura, Shoji; and Tanimura, Akira, 4,617,983, Cl. 164-463.000.

Tanmatsu, Katsuo: *See*—
Nohara, Kazunori; Tanmatsu, Katsuo; Hosoya, Nobukazu; and Higashino, Takeshi, 4,618,888, Cl. 358-120.000.

Tarassoff, Serge, to Pomagalski S.A. Device for measuring clamping of grips notably of a detachable gondola lift or chair lift. 4,617,829, Cl. 73-865.800.

Tarter, Norman D. Floppy disc casing with optional write-protect capability. 4,618,060, Cl. 206-444.000.

Tasaka, Kentaro: *See*—
Iwama, Akio; Tasaka, Kentaro; and Kazuse, Yoshitaka, 4,618,534, Cl. 428-316.600.

Tashiro, Korefumi: *See*—
Ueno, Masahiro; Tashiro, Korefumi; and Toyota, Eiichi, 4,618,930, Cl. 364-426.000.

Task, Harry L.: *See*—
Genco, Louis V.; and Task, Harry L., 4,618,231, Cl. 351-237.000.

Tatani, Atsushi: *See*—
Shinoda, Naoharu; Tatani, Atsushi; Omoto, Setsuo; Okino, Susumu; and Shimizu, Taku, 4,618,482, Cl. 423-242.000.

Taubitz, Christof; Muench, Volker; Hambrecht, Juergen; Echte, Adolf; and Illers, Karl H., to BASF Aktiengesellschaft. Halogen-free self-extinguishing thermoplastic molding material. 4,618,633, Cl. 524-80.000.

Taylor, John H.: *See*—
Bainbridge, Gary R.; McCauley, Lewis D.; and Taylor, John H., 4,618,299, Cl. 411-374.000.

Taylor, Larry T.: *See*—
Johnson, Charles C.; and Taylor, Larry T., 4,618,769, Cl. 250-338.000.

Taylor, William J.: *See*—
Adams, William C.; and Taylor, William J., 4,617,951, Cl. 135-66.000.

TDK Corporation: *See*—
Morita, Haruyuki; Yoshinari, Jiro; and Nakayama, Masatoshi, 4,618,542, Cl. 428-694.000.
Nishimatsu, Masaharu; Ide, Toshiaki; Arioka, Hiroyuki; and Kubota, Yuichi, 4,618,535, Cl. 428-325.000.

Team Engineering and Manufacturing, Inc.: *See*—
Falgout, Thomas E., Sr.; and Hester, John W., 4,618,010, Cl. 175-329.000.

Team, Inc.: *See*—
Bori, Jacques, 4,617,694, Cl. 15-167.00R.

Teglasy, Gyorgy; and Galambos, Ludwig. Coin-operable machine for dispensing cooling elements. 4,618,074, Cl. 221-15.000.

Teleco Oilfield Services Inc.: *See*—
Raynal, Jean C., 4,618,828, Cl. 324-347.000.

Teleplex Corporation: *See*—
Maxwell, Duane S.; Phillips, Roger; and Schwan, Eduard A., 4,618,965, Cl. 375-10.000.

Temple, James S.; Legierse, Petrus E. J.; and Martens, Theodorus H. G., to U.S. Philips Corporation. Method of providing a metal mirror. 4,618,506, Cl. 427-40.000.

Tennessee Valley Authority: *See*—
Medina, Ramiro; and Sullivan, Jack M., 4,618,691, Cl. 558-80.000.

Teraji, Tsutomu; Shiokawa, Youichi; Okumura, Kazuo; and Sato, Yoshinari, to Fujisawa Pharmaceutical Co., Ltd. Triazine derivatives, and pharmaceutical compositions comprising the same. 4,618,610, Cl. 514-242.000.

Teramoto, Osamu: *See*—
Yamano, Shoji; Mikata, Yoshitaka; Teramoto, Osamu; and Nishide, Kazuhiro, 4,618,012, Cl. 177-25.000.
Yamano, Shoji; Mikata, Yoshitaka; Teramoto, Osamu; and Nishide, Kazuhiro, 4,618,013, Cl. 177-25.000.

Terman, Lewis M.: *See*—
Chappell, Barbara A.; Rajeevakumar, Thekkemadathil V.; Schuster, Stanley E.; and Terman, Lewis M., 4,618,784, Cl. 307-449.000.

Terumo: *See*—
Ichikawa, Toshiji; and Shimizu, Atsushi, 4,617,941, Cl. 128-765.000.

Teschendorf, Hans-Jurgen: *See*—
Schlecker, Rainer; Schmidt, Peter; Thieme, Peter C.; Lenke, Dieter; Teschendorf, Hans-Jurgen; Traut, Martin; Mueller, Claus D.; Hofmann, Hans P.; and Kreiskott, Horst, 4,618,622, Cl. 514-457.000.

Tessier, Jean; and Girault, Pierre, to Roussel Uclaf. 3-(2-tetrahydropyranyl)-1,2,3,4,5,6,7-hexahydro-1-p-tolyloxycarbonyl-5H-cyclopentapyrimidine-2,4-dione and herbicidal compositions and methods using it. 4,618,364, Cl. 71-92.000.

Tetra Pak International AB: *See*—
Nygren, Jan; and Hilmersson, Anders, 4,617,779, Cl. 53-433.000.

Texaco Inc.: *See*—
Brown, Alfred, 4,617,993, Cl. 166-250.000.
Renken, Terry L.; and Knifton, John F., 4,618,717, Cl. 564-475.000.

Texas Instruments Incorporated: *See*—
Parfitt, Steven P., 4,618,848, Cl. 340-347.0CC.
Schenck, Stephen R., 4,618,832, Cl. 330-254.000.
Tran, Bao G.; Neal, Joseph H.; and White, Lionel S., 4,618,947, Cl. 365-230.000.

Texo Corporation: *See*—
Kinkelaar, Edmund W.; and Pekar, Howard G., 4,618,513, Cl. 427-443.100.

Texon, Inc.: *See*—
Bodendorf, Warren J., 4,618,401, Cl. 162-138.000.

Th. Goldschmidt AG: *See*—
Esselborn, Eberhard; and Fock, Jurgen, 4,618,457, Cl. 260-504.00R.

Thalmann, Alfred; and Lehmann, Ernesto, to Georg Fischer Aktiengesellschaft. Apparatus for the heat-sealing thermoplastic conduits with a bridging conductor. 4,618,168, Cl. 285-21.000.

Thanawalla, Chandrakant B.; and Dehm, David C., to Atlantic Richfield Company. Production of the acrylates and methacrylates of oxyalkylated allyl alcohol. 4,618,703, Cl. 560-209.000.

Theeuwes, Felix: *See*—
DuBois, Mark; Theeuwes, Felix; and Wong, Patrick S. L., 4,618,487, Cl. 424-15.000.

Theisen, Dieter: *See*—
Hartel, Volker; and Theisen, Dieter, 4,618,128, Cl. 267-140.100.

Theobald, Paul R., to General Electric Company. Plastic chip carrier package. 4,618,739, Cl. 174-52.0FP.

Theradyne Corporation: *See*—
Suhre, Robert B., 4,617,919, Cl. 128-78.000.

Therrien, Roger H.; and Chahal, Maninderpal S., to NCR Canada Ltd. Automatic light control system. 4,618,254, Cl. 355-68.000.

Thieme, Peter C.: *See*—
Schlecker, Rainer; Schmidt, Peter; Thieme, Peter C.; Lenke, Dieter; Teschendorf, Hans-Jurgen; Traut, Martin; Mueller, Claus D.; Hofmann, Hans P.; and Kreiskott, Horst, 4,618,622, Cl. 514-457.000.

Thomas & Betts Corporation: *See*—
Beck, William R.; Jahn, William; Koltenback, Steven R.; Scharf, Robert M.; and Schwab, Ronald, 4,617,732, Cl. 29-866.000.
Greenwood, William S.; and Weinmann, Karl, 4,618,203, Cl. 339-99.00R.

Sonobe, Toshimitsu, 4,618,209, Cl. 339-258.00R.

Thomas, Dennis R.: *See—*
Kress, Edward S.; LaBerdia, William L.; and Thomas, Dennis R., 4,618,307, Cl. 414-498.000.

Thomas, Richard L. Adjustable reticle device. 4,618,221, Cl. 350-566.000.

Thompson, David L.: *See—*
Hazen, Wayne W.; Thompson, David L.; Reynolds, James E.; Lombardo, Nicholas J.; Queneau, Paul B.; and Hager, John P., 4,618,480, Cl. 423-127.000.

Thompson, Harry A., III, to Heinemann Electric Company. Circuit breaker mechanism. 4,618,745, Cl. 200-50.00C.

Thompson, Steven M.: *See—*
Mortvedt, Raymond L.; and Thompson, Steven M., 4,618,148, Cl. 273-73.00C.

Thompson, Thomas D., III; Polestak, Walter J.; and Bradshaw, Robert W., to Georgia Kaolin Company, Inc. High solids processing of kaolinitic clays with post-leaching oxidation. 4,618,374, Cl. 106-288.00B.

Thomson Components - Mostek Corporation: *See—*
Johnson, Mark G., 4,618,786, Cl. 307-578.000.
van Tran, Hiep, 4,618,785, Cl. 307-530.000.

Thoresen, Per: *See—*
Fonne, Gunnar J.; Daae-Johansen, Finn; Thoresen, Per; and Nilsen, Stein-Arne, 4,617,777, Cl. 52-802.000.

Thorud, Richard A.; and White, Donald M., III, to Toro Company, The. Single stage snowthrower. 4,617,747, Cl. 37-244.000.

Thro, Stuart W., to Motorola, Inc. Self-calibrating signal strength detector. 4,619,002, Cl. 455-226.000.

Thulin, Robert R., to Nabisco Brands, Inc. Process for producing latticed pastry products. 4,618,498, Cl. 426-275.000.

Timex Corporation: *See—*
Kamens, Bruce H.; and Ritter, George E., 4,618,264, Cl. 368-74.000.

Timko, Joseph M., to Upjohn Company, The. Ethynylation of 16-methyl-17-keto steroids. 4,618,456, Cl. 260-397.400.

Timm, Heinrich: *See—*
Hasler, Franz; Monch, Ernst; Reiter, Karl; and Timm, Heinrich, 4,618,163, Cl. 280-785.000.

Tinnes, Bernhard; Knell, Bernhard; and Vetterli, Walter, to Metacon AG. Swivelling sliding closure unit. 4,618,126, Cl. 266-271.000.

Tirtiaux, Robert: *See—*
Prillieux, Marcel; Laurent, Robert M.; and Tirtiaux, Robert, 4,618,458, Cl. 260-505.00P.

Titmus Eurocon Kontaktlinsen GmbH: *See—*
Baron, Heinz; Hoefer, Peter; and Schwind, Herbert, 4,618,228, Cl. 351-161.000.

Tocco, Inc.: *See—*
Balzer, Norbert R., 4,618,125, Cl. 266-90.000.

Todokoro, Tomoo; Okimoto, Haruo; and Matsuda, Ikuo, to Mazda Motor Corporation. Plural turbine inlet passage turbo-supercharger with inlet passage shut-off valve. 4,617,799, Cl. 60-602.000.

Tokai TRW & Co., Ltd.: *See—*
Maeda, Naoyuki, 4,618,809, Cl. 318-768.000.
Okuyama, Takahiro; Toki, Susumu; and Ishihara, Masahito, 4,617,883, Cl. 123-90.440.

Toki, Susumu: *See—*
Okuyama, Takahiro; Toki, Susumu; and Ishihara, Masahito, 4,617,883, Cl. 123-90.440.

Tokuda, Makoto; and Kimoto, Takami, to Mazda Motor Corporation. Automobile roof structure. 4,618,181, Cl. 296-191.000.

Tokuse, Masahiro: *See—*
Yamamura, Takemi; Tokuse, Masahiro; and Waku, Yoshiharu, 4,618,529, Cl. 428-224.000.

Tokuyama, Shunji; Suzuki, Koji; and Arimatsu, Keiji, to Hitachi, Ltd. DC circuit breaker. 4,618,905, Cl. 361-4.000.

Tokuyama Soda Kabushiki Kaisha: *See—*
Kuramoto, Nobuyuki; and Taniguchi, Hitofumi, 4,618,592, Cl. 501-96.000.

Tokyo Electric Co., Ltd.: *See—*
Kawaguchi, Katsuhiko; and Ono, Yoshiaki, 4,618,134, Cl. 271-4.000.
Uchimura, Mitsuo; and Uematsu, Satoru, 4,618,392, Cl. 156-384.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Hashimoto, Masahiro; and Tani, Hideo, 4,618,349, Cl. 51-298.000.
Honda, Michitaka; and Kikuchi, Katsuya, 4,618,928, Cl. 364-414.000.
Iida, Tetsuya; and Tanaka, Fuminari, 4,618,847, Cl. 340-347.0DA.
Nagase, Masashi, 4,618,934, Cl. 364-507.000.
Sakurai, Takayasu; and Iizuka, Tetsuya, 4,618,945, Cl. 365-189.000.

Tollis, Aurelio: *See—*
Cabany, Pierre; Gardette, Andre; Jacquet, Xavier; Tollis, Aurelio; and Tollis, Fernando, 4,618,757, Cl. 219-60.00R.

Tollis, Fernando: *See—*
Cabany, Pierre; Gardette, Andre; Jacquet, Xavier; Tollis, Aurelio; and Tollis, Fernando, 4,618,757, Cl. 219-60.00R.

Toma, Hitoshi: *See—*
Tanaka, Shigemori; Sumino, Fumio; and Toma, Hitoshi, 4,618,552, Cl. 430-60.000.

Tomaszewski, Walter, to Firestone Tire & Rubber Company, The. Mechanical fastener for roofing membrane and method of applying same. 4,617,771, Cl. 52-410.000.

Tomida, Yoshinori: *See—*
Munakata, Hirohide; Tomida, Yoshinori; Haruta, Masahiro; Hirai, Yutaka; Nishimura, Yukuo; and Hamamoto, Takashi, 4,618,561, Cl. 430-156.000.

Tomidokoro, Kanji, to Komamura Photographic Co., Ltd. Film holder for cameras. 4,618,062, Cl. 206-455.000.

Tomimitsu, Yasuharu, to NEC Corporation. Address indication circuit capable of relatively shifting channel addresses relative to memory addresses. 4,618,942, Cl. 364-900.000.

Tomioka, Kenichi: *See—*
Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; and Tomioka, Kenichi, 4,618,627, Cl. 514-678.000.

Tomy Kogyo Co. Inc.: *See—*
Abe, Akira, 4,618,330, Cl. 446-236.000.

Topfl, Werner: *See—*
Gass, Karl; Fory, Werner; Meyer, Willy; and Topfl, Werner, 4,618,363, Cl. 71-90.000.

Torley, Jozsef: *See—*
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,618,611, Cl. 514-255.000.

Toro Company, The: *See—*
Thorud, Richard A.; and White, Donald M., III, 4,617,747, Cl. 37-244.000.

Torres, John R.: *See—*
Vesce, Richard V.; and Torres, John R., 4,618,813, Cl. 323-268.000.

Torti, Mario; and Fernandez, Emilio, to S. A. Martin. Automatic device for bringing into register a tool mounted on a rotary cylinder for processing products in sheet form. 4,618,391, Cl. 156-353.000.

Toshimitsu, Yoshihiko; Takaoka, Tokuro; Kawai, Toshitake; and Ishida, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Power steering device for vehicles. 4,618,018, Cl. 180-142.000.

Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, to Richter Gedeon Vegyeszeti Gyar Rt. 1-(aminoalkoxyphenyl)-1-phenyl-propanols, process for their preparation and pharmaceutical compositions containing them. 4,618,611, Cl. 514-255.000.

Totten, George E.: *See—*
Harding, Ronald H.; and Totten, George E., 4,617,984, Cl. 165-1.000.

Toukan, Sameeh S.; and King, James P., to Pennwalt Corporation. Polymeric thiadiazole lubricant additive. 4,618,438, Cl. 252-47.500.

Tower, Douglass G. Orientable ripper. 4,618,005, Cl. 172-459.000.

Town, Michael-Harold: *See—*
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Mannesmann, Gerda; Nieuweboer, Bob; and Town, Michael-Harold, 4,618,626, Cl. 514-530.000.

Townsend, Peter K., to Du Pont de Nemours, E. I., and Company. Connector for establishing electrical contact with a high count twisted pair cable. 4,618,201, Cl. 339-99.00R.

Toyama Chemical Co., Ltd.: *See—*
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,618,606, Cl. 514-202.000.

Toyo Ink Mfg. Co., Ltd.: *See—*
Ohashi, Masato; Kashioka, Motohiko; Tamura, Shinichi; Katsura, Hiromitsu; Ueda, Hideaki; and Nakamura, Akihiro, 4,618,554, Cl. 430-78.000.

Toyo Polymer Co., Ltd.: *See—*
Kageyama, Hidehei, 4,618,280, Cl. 401-107.000.

Toyohara, Tsutomu: *See—*
Sasano, Ryoichiro; Toyohara, Tsutomu; and Takigawa, Toshimichi, 4,617,845, Cl. 82-1.00C.

Toyoshima, Tatsue: *See—*
Inoue, Kiyoshi; and Toyoshima, Tatsue, 4,618,761, Cl. 219-517.000.

Toyota, Eiichi: *See—*
Ueno, Masahiro; Tashiro, Korefumi; and Toyota, Eiichi, 4,618,930, Cl. 364-426.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Hayashi, Hideyuki, 4,618,022, Cl. 180-249.000.
Isobe, Masahiro; Okazaki, Sumio; and Tanaka, Hideki, 4,618,336, Cl. 474-133.000.
Kato, Hideaki; and Oohashi, Kaoru, 4,618,156, Cl. 280-6.00R.
Kobayashi, Nobuyuki; and Ito, Toshimitsu, 4,617,890, Cl. 123-339.000.
Nakanishi, Nobuyasu; and Nomura, Yoshihisa, 4,618,189, Cl. 303-116.000.
Nishimura, Takumi; and Saito, Tadao, 4,618,188, Cl. 303-116.000.
Okawa, Susumu; and Jufuku, Yasunobu, 4,618,337, Cl. 474-201.000.
Ryu, Nobuyuki, 4,618,164, Cl. 280-804.000.
Yoshizaki, Kouji, 4,617,880, Cl. 123-90.160.

Tozzolino, Pierre: *See—*
Levesque, Guy; and Tozzolino, Pierre, 4,618,416, Cl. 209-166.000.

Tran, Bao G.; Neal, Joseph H.; and White, Lionel S., to Texas Instruments Incorporated. Dynamic memory with improved address counter for serial modes. 4,618,947, Cl. 365-230.000.

Traut, Martin: *See—*
Schlecker, Rainer; Schmidt, Peter; Thieme, Peter C.; Lenke, Dieter; Teschendorf, Hans-Jurgen; Traut, Martin; Mueller, Claus D.; Hofmann, Hans P.; and Kreiskott, Horst, 4,618,622, Cl. 514-457.000.

Traver, Frank J.; and Simoneau, Edward T., to General Electric Company. Novel aminofunctional silicone compositions. 4,618,689, Cl. 556-425.000.

Tremouilles, Francis J. M. G.: *See*—
Allais, Jean-Philippe P. B.; and Tremouilles, Francis J. M. G., 4,617,852, Cl. 89-36.130.
Triggs, Geoffrey W.; Lightowlers, Richard J.; Robinson, Derek; and Rice, Graham, to United Kingdom Atomic Energy Authority. Heat pipe stabilized specimen container. 4,617,985, Cl. 165-32.000.
Trinh, Vuong D.: *See*—
Magee, Robert D.; Asztalos, Michael J.; and Trinh, Vuong D., 4,618,824, Cl. 324-208.000.
Trinn, Maria; Kordik, Gabriella; Udvardy-Nagy nee Cserey Pechaany, Eva; Vida, Zsuzsanna; and Zsoka nee Somkuti, Rzsebet, to Richter Gedeon Vegyeszeti Gyar RT. Clavine-producing strain, a process for the preparation thereof as well as a microbiological process for producing clavine alkaloids. 4,618,581, Cl. 435-119.000.
Truth Inc.: *See*—
Vetter, Gregory J., 4,617,758, Cl. 49-324.000.
TRW Inc.: *See*—
Sherwood, Duane D.; and Conway, John J., 4,618,111, Cl. 244-158.00R.
Tsai, Mei-Yuan, to Aluminum Company of America. Metalworking with a lubricant composition comprising mineral oil and alkoxyalkyl ester. 4,618,441, Cl. 252-49.500.
Tsay, Yuh-Geng; and Shah, Vipin D., to International Immunoassay Laboratories, Inc. Kinetic radioimmunoassay test method and device. 4,618,485, Cl. 424-1.100.
Tsubata, Hisayasu; Tamamura, Shoji; and Tanimura, Akira, to Unitika Ltd. Method and apparatus for continuously manufacturing metal filaments. 4,617,983, Cl. 164-463.000.
Tsubata, Hisayasu: *See*—
Tanimura, Akira; Tsubata, Hisayasu; and Tamamura, Shoji, 4,617,982, Cl. 164-463.000.
Tsuchida, Naoki: *See*—
Aoi, Kazuo; and Tsuchida, Naoki, 4,617,881, Cl. 123-90.270.
Tsuchida, Seiichi; Kodama, Yoshihiro; and Hara, Hiroari, to Arakawa Kagaku Kogyo Kabushiki Kaisha. Hot-melt adhesive compositions comprising a partially (fumarized and/or maleinized) disproportionated rosin ester tackifier. 4,618,640, Cl. 524-272.000.
Tsuji, Masaru, to Sharp Kabushiki Kaisha. Photoreceptor pre-initializing electrophotographic copying machine. 4,618,247, Cl. 355-14.0FU.
Tsuji, Sadahiko: *See*—
Hattori, Jun; and Tsuji, Sadahiko, 4,618,762, Cl. 250-201.000.
Sugiura, Muneharu; Fujibayashi, Kazuo; and Tsuji, Sadahiko, 4,618,219, Cl. 350-427.000.
Tsukada, Toshihisa: *See*—
Sasano, Akira; Seki, Kouichi; Yamamoto, Hideaki; Baji, Toru; and Tsukada, Toshihisa, 4,618,873, Cl. 357-23.700.
Tsukune, Hideo; and Goto, Keisuke, to Michio Kawata, Director-General of Agency of Industrial Science and Technology; and Kabushiki Kaisha Meidensha. Method and system for detecting elliptical objects. 4,618,989, Cl. 382-25.000.
Tsumura Juntendo Inc.: *See*—
Okuda, Hiromichi; Masuno, Hiroshi; Aburada, Masaki; Takeda, Shigefumi; Itoh, Eiko; Matsushita, Moe; and Hosoya, Eikichi, 4,618,495, Cl. 424-195.100.
Tsunefuji, Katsuhiko: *See*—
Maitani, Yoshihisa; Tsunefuji, Katsuhiko; and Yamasaki, Masafumi, 4,618,238, Cl. 354-431.000.
Tsurumaru, Shinobu: *See*—
Kajiwara, Tadashi; Sato, Akira; Tsurumaru, Shinobu; and Kumamoto, Kenichiro, 4,618,838, Cl. 333-33.000.
Tsushima, Takuya: *See*—
Hirota, Akira; and Tsushima, Takuya, 4,618,893, Cl. 358-167.000.
Tsutaka, Yoshikazu: *See*—
Badono, Shinji; and Tsutaka, Yoshikazu, 4,618,969, Cl. 377-49.000.
Tsutaya, Kenzo: *See*—
Takamiya, Shigeo; Inoue, Kazutoshi; and Tsutaya, Kenzo, 4,618,298, Cl. 405-150.000.
Twardosz, Brian. Weight lifting bar. 4,618,143, Cl. 272-123.000.
U.K. Research Foundation: *See*—
Smith, Stanford L.; Wang, Paul C.; and Coffey, Charles W., 4,618,826, Cl. 324-308.000.
UBE Industries, Ltd.: *See*—
Yamamura, Takemi; Tokuse, Masahiro; and Waku, Yoshiharu, 4,618,529, Cl. 428-224.000.
Ubukata, Kazumi: *See*—
Kimura, Ryoichi; Nomura, Kanji; Ubukata, Kazumi; and Kasahara, Shinju, 4,618,132, Cl. 296-97.00J.
Uchida, Seiichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Resin printing plate and preparation thereof. 4,618,550, Cl. 430-11.000.
Uchimura, Mitsuo; and Uematsu, Satoru, to Tokyo Electric Co., Ltd. Label adhering apparatus. 4,618,392, Cl. 156-384.000.
Udvardy-Nagy nee Cserey Pechaany, Eva: *See*—
Trinn, Maria; Kordik, Gabriella; Udvardy-Nagy nee Cserey Pechaany, Eva; Vida, Zsuzsanna; and Zsoka nee Somkuti, Rzsebet, 4,618,581, Cl. 435-119.000.
Ueda, Hideaki: *See*—
Ohashi, Masato; Kashioka, Motohiko; Tamura, Shinichi; Katsura, Hiromitsu; Ueda, Hideaki; and Nakamura, Akihiro, 4,618,554, Cl. 430-78.000.
Ueda, Hirohisa, to Asahi Kogaku Kogyo Kabushiki Kaisha. End curving device for endoscope. 4,617,914, Cl. 128-4.000.
Uematsu, Satoru: *See*—
Uchimura, Mitsuo; and Uematsu, Satoru, 4,618,392, Cl. 156-384.000.
Uemura, Seiichi; Hirose, Takao; Shohda, Yoshio; Sakamoto, Takayoshi; and Katoh, Kenji, to Nippon Oil Company. Process for producing pitch carbon fibers. 4,618,463, Cl. 264-29.200.
Ueno, Masahiro; Tashiro, Korefumi; and Toyota, Eiichi, to Hitachi Ltd. Automatic train control apparatus. 4,618,930, Cl. 364-426.000.
Uetake, Yoshinari: *See*—
Araki, Youichi; and Uetake, Yoshinari, 4,618,877, Cl. 357-56.000.
Ugaji, Masana: *See*—
Okamura, Kiyohito; Hasegawa, Yoshio; Kuroo, Yoshiyasu; and Ugaji, Masana, 4,618,591, Cl. 501-90.000.
Ui, Hiromitu: *See*—
Ohashi, Tamaki; Suzuki, Tsunefusa; Nakada, Kaoru; Hoshi, Nobuya; Fujimura, Hisao; and Ui, Hiromitu, 4,617,831, Cl. 74-10.330.
Ullrich, Norbert: *See*—
Kohnen, Klaus; Niermann, Hans; and Ullrich, Norbert, 4,617,988, Cl. 165-95.000.
Umemoto, Atsushi: *See*—
Nagase, Hidenobu; and Umemoto, Atsushi, 4,617,887, Cl. 123-279.000.
Umezawa, Mitsuo: *See*—
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, 4,617,840, Cl. 74-865.000.
Union Carbide Corp.: *See*—
Fan, You-Ling; Brode, George L.; and Rosen, Meyer R., 4,618,647, Cl. 524-801.000.
Harding, Ronald H.; and Totten, George E., 4,617,984, Cl. 165-1.000.
Huang, Jamin, 4,618,603, Cl. 514-80.000.
Osborn, Claiborn L.; Koleske, Joseph V.; and Drake, Kenneth, 4,618,635, Cl. 524-113.000.
Union Oil Company of California: *See*—
Young, Dean A.; and Koepke, Jeffery W., 4,618,738, Cl. 585-480.000.
Uniroyal Chemical Company, Inc.: *See*—
Covey, Rupert A.; Forbes, Patricia J.; and Bell, Allyn R., 4,618,365, Cl. 71-92.000.
United Biscuits (UK) Limited: *See*—
Wainwright, Andrew R., 4,618,499, Cl. 426-283.000.
United Kingdom Atomic Energy Authority: *See*—
Lovegrove, Peter C., 4,618,409, Cl. 204-300.00R.
Triggs, Geoffrey W.; Lightowlers, Richard J.; Robinson, Derek; and Rice, Graham, 4,617,985, Cl. 165-32.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Baldwin, David A., 4,617,836, Cl. 74-682.000.
United States of America
Agriculture: *See*—
Couey, H. Melvin; and Hayes, Charles F., 4,618,497, Cl. 426-233.000.
Harper, Robert J., Jr., 4,618,512, Cl. 427-381.000.
Air Force: *See*—
Armitage, David, 4,618,217, Cl. 350-355.000.
Gegel, Harold L.; Malas, James C.; Prasad, Yellapregada V. R. K.; Doraivelu, Sokka M.; Barker, Douglas R.; Morgan, James T., Jr.; and Lark, Kristine A., 4,617,817, Cl. 72-364.000.
Genco, Louis V.; and Task, Harry L., 4,618,231, Cl. 351-237.000.
Miller, William H.; McClendon, Samuel E.; Kolodziej, Raymond J.; and Brand, Donald L., 4,618,931, Cl. 364-431.020.
Commerce: *See*—
Brinckman, Frederick E.; Degnan, Thomas F., Jr.; and Weiss, Carl S., 4,618,410, Cl. 208-97.000.
Energy: *See*—
Borden, Albert R., 4,617,789, Cl. 57-6.000.
Burke, William F.; and Winiecki, Alan L., 4,618,267, Cl. 374-50.000.
Harris, Betty W., 4,618,452, Cl. 252-408.100.
Johnson, Charles C.; and Taylor, Larry T., 4,618,769, Cl. 250-338.000.
National Aeronautics and Space Administration: *See*—
Alcorn, George E.; and Burgess, Andre S., 4,618,380, Cl. 148-187.000.
Keller, Vernon W.; Owen, Robert B.; Elkins, Bobby R.; and White, William T., 4,618,215, Cl. 350-319.000.
Parker, John A.; Heimbuch, Alvin H.; Hsu, Ming-ta S.; and Chen, Timothy S., 4,618,652, Cl. 525-282.000.
Navy: *See*—
Fried, Lawrence, 4,618,223, Cl. 350-611.000.
Kim, Oh-Kil, 4,618,453, Cl. 252-500.000.
U.S. Philips Corporation: *See*—
Baudry, Hugues, 4,618,590, Cl. 501-17.000.
Brettschneider, Horst; Hartl, Walter; and Peter, Diethard, 4,618,977, Cl. 378-139.000.
Flisikowski, Peter, 4,618,789, Cl. 310-13.000.
Hasler, Rudolf, 4,618,829, Cl. 329-103.000.
Sharpe, Anthony K.; and Mabey, Peter J., 4,618,955, Cl. 371-37.000.
Temple, James S.; Legierse, Petrus E. J.; and Martens, Theodorus H. G., 4,618,506, Cl. 427-40.000.
van der Mast, Karel D.; and Gross, Ulrich, 4,618,766, Cl. 250-311.000.
Watkinson, Stephen W., 4,618,999, Cl. 455-108.000.
United Technologies Corporation: *See*—
Vesce, Richard V.; and Torres, John R., 4,618,813, Cl. 323-268.000.

Unitika Ltd.: *See*—
Tanimura, Akira; Tsubata, Hisayasu; and Tamamura, Shoji, 4,617,982, Cl. 164-463.000.
Tsubata, Hisayasu; Tamamura, Shoji; and Tanimura, Akira, 4,617,983, Cl. 164-463.000.

University of Birmingham, The: *See*—
Jefferis, Royston; and Steensgaard, Jens, 4,618,589, Cl. 436-540.000.

University of Calif., The Regents of the: *See*—
Rapoport, Henry; and Buckley, Thomas F., III, 4,618,710, Cl. 564-1.000.

University of California, The Regents of The: *See*—
Handley, Harold H.; Glassy, Mark C.; Hagiwara, Yoshihide; and Hagiwara, Hideaki, 4,618,577, Cl. 435-7.000.

University of Delaware: *See*—
Bulkowski, John E., 4,618,509, Cl. 427-74.000.

University of Hawaii, The: *See*—
Couey, H. Melvin; and Hayes, Charles F., 4,618,497, Cl. 426-233.000.

University of Kentucky Research Foundation, The: *See*—
Kadaba, Pankaja K., 4,618,681, Cl. 546-276.000.

University of Rochester, The: *See*—
Mourou, Gerard; and Valdmanis, Janis A., 4,618,819, Cl. 324-77.00K.

University of Sheffield, The: *See*—
Brown, Brian H.; Barber, David C.; and Freeston, Ian L., 4,617,939, Cl. 128-734.000.

University of Utah, The: *See*—
Eddington, Donald K., 4,617,913, Cl. 128-1.00R.

UNR, Inc.: *See*—
Freeman, Jerry H., 4,618,205, Cl. 339-125.00L.

Upjohn Company, The: *See*—
Tang, Andrew H., 4,618,621, Cl. 514-408.000.
Timko, Joseph M., 4,618,456, Cl. 260-397.400.

Urasaki, Shuji: *See*—
Makino, Shigeru; Katagi, Takashi; Urasaki, Shuji; Kawabata, Shunichiro; and Kobayashi, Yuji, 4,618,866, Cl. 343-779.000.

Urdea, Mickey S.: *See*—
Burke, Rae L.; Urdea, Mickey S.; and Valenzuela, Pablo D. T., 4,618,578, Cl. 435-68.000.

Uriuhara, Makoto: *See*—
Hattori, Toshihiro; Ishihara, Masaki; Uriuhara, Makoto; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,618,043, Cl. 192-0.052.

Urushibata, Hiroaki: *See*—
Matsumura, Mitsuie; Yoshimura, Motomu; and Urushibata, Hiroaki, 4,618,543, Cl. 429-19.000.

Urushihara, Toshio: *See*—
Kimura, Tokuji; and Urushihara, Toshio, 4,618,085, Cl. 225-100.000.

USM Corporation: *See*—
Gilch, Heinz; von Voithenberg, Hubertus; and Albert, Karl-Heinz, 4,618,651, Cl. 525-130.000.
von Voithenberg, Hubertus; and Hillert, Gotz, 4,618,643, Cl. 524-430.000.

Usui, Hideo: *See*—
Ichijima, Seiji; Usui, Hideo; and Deguchi, Naoyasu, 4,618,571, Cl. 430-505.000.

Vache , Michel P.: *See*—
Michel, Dominique; Johnson, Delbert B.; Pages, Jean F.; Foglia, Vincent F. P.; Martin, Jean G. M.; Vache , Michel P.; Sedillot, Francois G.; and Crull, Carroll M., 4,618,286, Cl. 405-208.000.

Vail, John G., to Mug-A-Phone, Inc. Combined insulated drinking mug and megaphone. 4,618,066, Cl. 215-12.00R.

Valdmanis, Janis A.: *See*—
Mourou, Gerard; and Valdmanis, Janis A., 4,618,819, Cl. 324-77.00K.

Valenzuela, Pablo D. T.: *See*—
Burke, Rae L.; Urdea, Mickey S.; and Valenzuela, Pablo D. T., 4,618,578, Cl. 435-68.000.

Van R Dental Products, Inc.: *See*—
Porteous, Don D.; and Wittrock, Paul M., 4,617,950, Cl. 132-91.000.

Vance, Ian A. W.; and Neale, Michael W., to Standard Telephones and Cables, plc. Radio receiver. 4,618,967, Cl. 375-80.000.

Vancouver General Hospital: *See*—
Ens, John; McEwen, James A.; and Beattie, Craig W., 4,618,230, Cl. 351-221.000.

van der Lely, Cornelis. Motor vehicle such as a tractor. 4,618,016, Cl. 180-53.600.

van der Mast, Karel D.; and Gross, Ulrich, to U.S. Philips Corporation. Automatically adjustable electron microscope. 4,618,766, Cl. 250-311.000.

Vanderschaeghe, Alain: *See*—
Franzolini, Marc; Maria, Edmond; Vanderschaeghe, Alain; and Bezier, Jean, 4,617,990, Cl. 165-173.000.

Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; and Beeland, William D., to Lummus Industries, Inc. Portable bin transfer system. 4,617,862, Cl. 100-53.000.

Van Exel, Gary A.: *See*—
White, Glenn S.; Mussler, Karl J.; and Van Exel, Gary A., 4,618,100, Cl. 239-440.000.

Van Horn, Albert R.: *See*—
Cooper, Gary F.; Edwards, John A.; and Van Horn, Albert R., 4,618,696, Cl. 560-53.000.

Van Laanen, Lawrence V.: *See*—
Holter, Warren G.; and Van Laanen, Lawrence V., 4,617,725, Cl. 29-598.000.

van Nes, Cornelis G. J.: *See*—
Libregts, Hubertus B.; and van Nes, Cornelis G. J., 4,618,202, Cl. 339-99.00R.

van Tran, Hiep, to Thomson Components - Mostek Corporation. CMOS sense amplifier with level shifter. 4,618,785, Cl. 307-530.000.

Varsanik, Richard G.: *See*—
Cha, Charles Y.; Varsanik, Richard G.; and Chen, Shih-Ruey T., 4,618,448, Cl. 252-180.000.

VEB Otto Buchwitz Starkstrom Anlagebau Dresden: *See*—
Bohme, Klaus; Beyer, Wolfgang; Seibt, Gunter; and Digmayer, Michael, 4,618,749, Cl. 200-144.00B.

Vecchio, Anthony J.; and Hudson, John H., Jr., to AMF Incorporated. Tobacco separator. 4,618,415, Cl. 209-134.000.

Vefi A/S: *See*—
Fonne, Gunnar J.; Daae-Johansen, Finn; Thoresen, Per; and Nilsen, Stein-Arne, 4,617,777, Cl. 52-802.000.

Veglia, Bartolomeo, to Riv-Skf Officine Di Villar Perosa S.p.A. Resilient block for attaching the upper end of a front suspension shock absorber to a vehicle body. 4,618,130, Cl. 267-153.000.

Veigel, Helmut: *See*—
Eckle, Otto; and Veigel, Helmut, 4,617,848, Cl. 82-36.00A.

Venås, Karl, to Ardal og Sundal Verk a.s. Method of treating and breaking up a liquid with the help of centripetal force. 4,618,427, Cl. 210-629.000.

Vereczkey, Laszlo : *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,618,611, Cl. 514-255.000.

Vertac Chemical Corporation: *See*—
Bernard, Milton S., 4,618,367, Cl. 71-121.000.

Vertesy, Laszlo ; Bender, Rudolf; and Fehlhaber, Hans-Wolfram, to Hoechst Aktiengesellschaft. Amine containing pseudooligosaccharide, pharmaceutical composition and method of use. 4,618,602, Cl. 514-54.000.

Vesce, Richard V.; and Torres, John R., to United Technologies Corporation. High efficiency series regulator. 4,618,813, Cl. 323-268.000.

Vesley, George F.: *See*—
Chamberlain, Craig S.; Vesley, George F.; Zimmerman, Patrick G.; and McAllister, Jerome W., 4,618,525, Cl. 428-209.000.

Vetter, Gregory J., to Truth Inc. Self-locking window operator. 4,617,758, Cl. 49-324.000.

Vetterli, Walter: *See*—
Tinnes, Bernhard; Knell, Bernhard; and Vetterli, Walter, 4,618,126, Cl. 266-271.000.

Vickers, Incorporated: *See*—
Read, John I.; and Roderick, Raymond T., 4,617,967, Cl. 137-625.640.

Victor Company of Japan, Ltd.: *See*—
Abe, Ryozo; and Sakurai, Masaki, 4,618,950, Cl. 369-32.000.
Hirota, Akira; and Tsushima, Takuya, 4,618,893, Cl. 358-167.000.
Ichinoi, Yutaka, 4,618,894, Cl. 358-310.000.
Watanabe, Tokumi, 4,618,851, Cl. 340-347.0DA.

Victor, Paul F., to Boeing Company, The. Wing trailing edge air dams. 4,618,109, Cl. 244-130.000.

Vida, Zsuzsanna: *See*—
Trinn, Maria; Kordik, Gabriella; Udvardy-Nagy nee Cserey Pechaany, Eva; Vida, Zsuzsanna; and Zsoka nee Somkuti, Rzsebet, 4,618,581, Cl. 435-119.000.

Vierveijzer, Franciscus: *See*—
Boeve, Gerard J.; and Vierveijzer, Franciscus, 4,618,137, Cl. 271-219.000.

Viklund, Ake E., to Electrolux Constructor Aktiebolag. Device for locking a beam to an upright, for example in a pallet rack. 4,618,064, Cl. 211-192.000.

Vinas, Antonio B., to Laboratorios Vinas, S.A. Zinc carbocysteinate. 4,618,625, Cl. 514-494.000.

Vincent, Jacques, to Allied Corporation. Venting device for an electronics housing. 4,618,071, Cl. 220-371.000.

Vineyard, Billy D.: *See*—
DeGeeter, Melvin J.; Lanza, Gregory M.; and Vineyard, Billy D., 4,618,604, Cl. 514-130.000.

Vistakon, Inc.: *See*—
Bayshore, Charles A., 4,618,227, Cl. 351-161.000.

Vitins, Michael, to BBC Brown, Boveri & Company Limited. Method for detecting a fault or also the direction of a fault in electric lines and means for executing this method. 4,618,933, Cl. 364-481.000.

Vittay, Pal: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo ; Vereczkey, Laszlo ; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,618,611, Cl. 514-255.000.

Vixseboxse, Albertus J.: *See*—
Heijnen, Joseph J.; Lourens, Pieter A.; and Vixseboxse, Albertus J., 4,618,418, Cl. 210-151.000.

Voigt, Hermann U.: *See*—
Schmidtchen, Hans-Martin; and Voigt, Hermann U., 4,618,654, Cl. 525-288.000.

Vojacek, Herbert: *See*—
Pflaum, Hermann; and Vojacek, Herbert, 4,618,049, Cl. 192-107.00M.

Volk, Heinrich, to Esselte Pendaflex Corporation. Hand labeling device. 4,618,393, Cl. 156-384.000.

Volk, Heinrich: *See—*
Neeb, Rudolf; Ironich, Wolfgang; and Volk, Heinrich, 4,618,701, Cl. 560-139.000.

Volland, Robert; Freitag, Hans-Albrecht; Seesing, Johannes; and Bergmann, Herbert, to Bayer Aktiengesellschaft. Upholstered seat having an air-permeable covering and a cold foam core. 4,618,532, Cl. 428-304.400.

Volvo BM AB: *See—*
Nilsson, Rolf, 4,618,153, Cl. 277-152.000.

von Holst, Johan P.; and Oskarsson, Rolf G., to Santrade Limited. Compound body and method of making the same. 4,618,540, Cl. 428-552.000.

von Voithenberg, Hubertus; and Hillert, Gotz, to USM Corporation. Glue stick adhesives. 4,618,643, Cl. 524-430.000.

von Voithenberg, Hubertus: *See—*
Gilch, Heinz; von Voithenberg, Hubertus; and Albert, Karl-Heinz, 4,618,651, Cl. 525-130.000.

Vorbrueggen, Helmut: *See—*
Skuballa, Werner; Raduechel, Bernd; Vorbrueggen, Helmut; Mannesmann, Gerda; Nieuweboer, Bob; and Town, Michael-Harold, 4,618,626, Cl. 514-530.000.

Vos, Cornelis; and Brasser, Jan, to Naarden International N.V. Process for flavoring tobacco. 4,617,945, Cl. 131-310.000.

Votaw, Brian T.: *See—*
Wahlstrom, Merle D.; and Votaw, Brian T., 4,617,868, Cl. 105-.000.

VSI Corporation: *See—*
Batten, Ronald W., 4,617,844, Cl. 81-436.000.

W. C. Heraeus GmbH: *See—*
Sturm, Walter; Becker, Helmut; Witt, Jurgen; Fritz, Werner; and Eysholdt, Ursula, 4,618,776, Cl. 250-372.000.

W. P. Hickman Co.: *See—*
Hickman, John B., 4,617,770, Cl. 52-214.000.

W. R. Grace & Co.: *See—*
Blouin, John J., 4,618,434, Cl. 252-8.510.

WABCO Westinghouse Fahrzeugbremsen GmbH: *See—*
Lichtenberg, Wolfgang, 4,617,961, Cl. 137-596.160.

WABCO Westinghouse Steuerungstechnik GmbH: *See—*
Kedzierski, Heinrich, 4,617,857, Cl. 92-88.000.

Wackman, Connie M., personal representative: *See—*
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,618,971, Cl. 378-34.000.

Wackman, Peter H., deceased: *See—*
Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased, 4,618,971, Cl. 378-34.000.

Wada, Kenichi: *See—*
Kubo, Kanji; Wada, Kenichi; and Shintani, Yooichi, 4,618,926, Cl. 364-200.000.

Wadowski, Richard A. Hexidecimal clock, and methods of constructing and utilizing same. 4,618,265, Cl. 368-82.000.

Wadsworth, Julian A. Ventilated toilet. 4,617,687, Cl. 4-213.000.

Wagenseil, Ludwig; and Merkle, Walter, to Hydromatik. Axial piston machine of the skew axis type with two independent working streams. 4,617,853, Cl. 91-505.000.

Wahlstrom, Merle D.; and Votaw, Brian T., to Miner Enterprises, Inc. Railroad hopper car with self-contained discharge system. 4,617,868, Cl. 105-.000.

Wainwright, Andrew R., to United Biscuits (UK) Limited. Methods for making filled extruded food products. 4,618,499, Cl. 426-283.000.

Wakashima, Yoshikazu; and Shimada, Sachio, to Hitachi, Ltd. Graphite-coated tube and process for producing the same. 4,618,406, Cl. 204-181.100.

Wakita, Saburo: *See—*
Ohe, Junya; Wakita, Saburo; Yamatsuta, Kiichi; Goto, Shoji; Kutsukake, Yukinori; and Sugizaki, Masuo, 4,618,474, Cl. 420-436.000.

Waku, Yoshiharu: *See—*
Yamamura, Takemi; Tokuse, Masahiro; and Waku, Yoshiharu, 4,618,529, Cl. 428-224.000.

Waletzko, Wallace. Device for manipulating cadavers. 4,617,706, Cl. 27-28.000.

Walker, Mary A.: *See—*
Knobel, Thomas M.; Kennedy, Earl E.; and Walker, Mary A., 4,618,630, Cl. 521-105.000.

Walker, Robert D., to Endotronics, Inc. Apparatus for administering a controlled dosage of a chemical substance having an improved culture chamber. 4,618,586, Cl. 435-1.000.

Walker, Robert G., to Industra Products Co. Inc. Method and apparatus for winding and inserting coils in a dynamoelectric machine stator core. 4,617,972, Cl. 140-92.100.

Wallace, John E., to Boeing Company, The. Universal matrix switching device. 4,618,755, Cl. 200-175.000.

Walls, John E.; and Liu, Shuchen, to American Hoechst Corporation. Aqueous developable lithographic printing plates containing an admixture of diazonium salts and polymers and composition therefor. 4,618,562, Cl. 430-157.000.

Wang, Joseph Y., to Miles Laboratories, Inc. Reagent test device containing hydrophobic barriers. 4,618,475, Cl. 422-56.000.

Wang, Ko Pen. Bronchoscopic needle assembly. 4,617,940, Cl. 128-753.000.

Wang, Paul C.: *See—*
Smith, Stanford L.; Wang, Paul C.; and Coffey, Charles W., 4,618,826, Cl. 324-308.000.

Ward, Dennis R.: *See—*
Bordeaux, Marvin L.; and Ward, Dennis R., 4,617,741, Cl. 33-228.000.

Watanabe, Haruzo: *See—*
Yamamoto, Hideomi; Watanabe, Haruzo; Kishie, Hidehiko; and Nishihara, Toshio, 4,617,717, Cl. 29-527.400.

Watanabe, Hiroo: *See—*
Kataoka, Kenzo; and Watanabe, Hiroo, 4,617,837, Cl. 74-785.000.

Watanabe, Junji, to Kabushiki Kaisha Toshiba. Image forming apparatus capable of selectively optically scanning one or more documents to be copied during one scanning operation. 4,618,244, Cl. 355-8.000.

Watanabe, Masae, to Yamaha Hatsudoki Kabushiki Kaisha. Wire wheel. 4,618,187, Cl. 301-56.000.

Watanabe, Masakane: *See—*
Kondo, Yasuo; Watanabe, Masakane; and Oshiro, Takao, 4,618,096, Cl. 239-101.000.

Watanabe, Tokumi, to Victor Company of Japan, Ltd. Apparatus for reproducing signals pre-stored in a memory. 4,618,851, Cl. 340-347.0DA.

Watanabe, Yasuo: *See—*
Sadaki, Hiroshi; Imaizumi, Hiroyuki; Nagai, Takashi; Takeda, Kenji; Myokan, Isao; Inaba, Takihiro; Watanabe, Yasuo; Fukuoka, Yoshikazu; Minami, Shinzaburo; and Saikawa, Isamu, 4,618,606, Cl. 514-202.000.

Watkinson, Stephen W., to U.S. Philips Corporation. Polar loop transmitter. 4,618,999, Cl. 455-108.000.

Watson, Ronald J.: *See—*
Fyfe, Edward R.; Slater, William M.; and Watson, Ronald J., 4,617,769, Cl. 52-167.000.

Watt, George; and Young, George E. Fuel briquettes and their preparation. 4,618,347, Cl. 44-16.00F.

Wattles, Jervis J. Portable lectern. 4,618,120, Cl. 248-460.000.

Wayman, William H.: *See—*
Hays, Dan A.; and Wayman, William H., 4,618,241, Cl. 355-3.0DD.

Wean United, Inc.: *See—*
Greenberger, Joseph I., 4,617,815, Cl. 72-39.000.

Webb, Tommy W.: *See—*
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; and Beeland, William D., 4,617,862, Cl. 100-53.000.

Weber, James L.; and Davidson, Donald J., to Rockwell International Corporation. Brake shoe retention apparatus. 4,618,034, Cl. 188-73.360.

Weber, Richard A.: *See—*
Ingersoll, Willard A.; Norquest, Robert C.; and Weber, Richard A., 4,617,781, Cl. 53-477.000.

Webster, Thelton A.: *See—*
Spruill, Howard T.; and Webster, Thelton A., 4,618,483, Cl. 423-304.000.

Weger, Kenneth F., Jr., to Knaack Mfg. Co. Ladder clamping device for vehicle rack. 4,618,083, Cl. 224-324.000.

Wehr, Eugene W.; Oster, Clark L.; and Evans, Terence J., to Square D Company. Arc extinguishing assembly. 4,618,751, Cl. 200-144.00R.

Weigel, Wolfgang, to Hughes Aircraft Company. Thermal imaging device having non-orthogonal scan position sensor to scanning mirror beam path angle. 4,618,768, Cl. 250-334.000.

Weiger, Gunter; Dorrie, Dieter; and Schwerdt, Paul, to Daimler-Benz Aktiengesellschaft. Actuating device for two mutually dependently actuable valves. 4,617,969, Cl. 137-627.500.

Weil, Edward D.: *See—*
Bay, W. Elliott; Reineke, Karl E.; and Weil, Edward D., 4,618,720, Cl. 568-17.000.

Weiland, Walter F., Jr.: *See—*
Gjertsen, Robert K.; Wilson, John F.; and Weiland, Walter F., Jr., 4,618,472, Cl. 376-446.000.

Weiler, Robert M., to O'Donnell, Joe, a part interest. Wiper blade edger. 4,617,765, Cl. 51-205.0WG.

Weinmann, Karl: *See—*
Greenwood, William S.; and Weinmann, Karl, 4,618,203, Cl. 339-99.00R.

Weinstein, Morris: *See—*
Green, Harold A.; and Weinstein, Morris, 4,618,370, Cl. 106-111.000.

Weiss, Arnold; Schutten, Herman P.; Cartz, Louis; Spellman, Gordon B.; Jaskolski, Stanley V.; and Wackman, Peter H., deceased (by Wackman, Connie M., personal representative), to Eaton Corporation. X-ray lithography system. 4,618,971, Cl. 378-34.000.

Weiss, Carl S.: *See—*
Brinckman, Frederick E.; Degnan, Thomas F., Jr.; and Weiss, Carl S., 4,618,410, Cl. 208-97.000.

Weiss, Wolfram; Balzer, Wolf-Dieter; Fikentscher, Rolf; Immel, Guenther; and Wolf, Hans, to BASF Aktiengesellschaft. Coating materials which contain α-hydroxyketones as antiskimming agents. 4,618,371, Cl. 106-263.000.

Weitz, Hans-Martin; and Fischer, Rolf, to BASF Aktiengesellschaft. Acyloxy-2-butenes and their preparation. 4,618,704, Cl. 560-262.000.

Welding Institute, The: *See—*
Murch, Michael G.; and Melton, Geoffrey B., 4,618,760, Cl. 219-130.400.

Wells, Oliver C.: *See—*
Smith, David A.; and Wells, Oliver C., 4,618,767, Cl. 250-311.000.

Wells, Robert L., to Procter & Gamble Company, The. Depilatory compositions. 4,618,344, Cl. 8-161.000.

Wells, Thomas R., to Bell & Howell Company. Desk top microform reader. 4,618,232, Cl. 353-79.000.

Welsh, John A.: *See—*
Babu, Suryadevara V.; Horwath, Ronald S.; Lu, Neng-hsing; and Welsh, John A., 4,618,477, Cl. 422-186.290.

Welter, Andre : *See—*
Dereu, Norbert; Welter, Andre ; Wendel, Albrecht; Leyck, Sigurd; Parnham, Michael; Graf, Erich; Sies, Helmut; Betzing, Hans; and Fischer, Hartmut, 4,618,669, Cl. 530-331.000.

Wendel, Albrecht: *See—*
Dereu, Norbert; Welter, Andre ; Wendel, Albrecht; Leyck, Sigurd; Parnham, Michael; Graf, Erich; Sies, Helmut; Betzing, Hans; and Fischer, Hartmut, 4,618,669, Cl. 530-331.000.

Werner H. K. Peters Maschinenfabrik GmbH: *See—*
Hoffmann, Martin, 4,618,394, Cl. 156-473.000.

Werner Turck GmbH & Co. KG: *See—*
Dahlheimer, Peter; and Soyck, Gerno, 4,618,823, Cl. 324-207.000.

Wersing, Wolfram: *See—*
Mohaupt, Jutta; Lubitz, Karl; Schnoeller, Manfred; and Wersing, Wolfram, 4,617,707, Cl. 29-25.350.

Westinghouse Electric Corp.: *See—*
Cooper, Glenn D.; Butler, John M., III; Morrison, Darrell R.; Senic, Charles L.; Nilsson, Lennart S.; and Rowe, Charles M., 4,618,795, Cl. 310-260.000.
Fisher, Marvin D.; and Bobsein, Louis E., 4,618,387, Cl. 156-244.110.
Fox, David A., 4,618,920, Cl. 363-37.000.
Gjertsen, Robert K.; Wilson, John F.; and Weiland, Walter F., Jr., 4,618,472, Cl. 376-446.000.
Lenhoff, John G., Jr., 4,618,850, Cl. 340-347.0CC.
Magee, Robert D.; Asztalos, Michael J.; and Trinh, Vuong D., 4,618,824, Cl. 324-208.000.
Martin, Raymond G.; and Mims, James H., 4,618,864, Cl. 342-162.000.
Paice, Derek A.; and Mattern, Kenneth E., 4,618,906, Cl. 361-5.000.
Sadhir, Rajender K., 4,618,507, Cl. 427-41.000.
Su, Wei-Fang A., 4,618,632, Cl. 522-43.000.
Yates, William W., 4,618,792, Cl. 310-156.000.

Westman, Erik: *See—*
Larsson, Hans G.; Westman, Erik; and Ostlund, Artur, 4,618,964, Cl. 373-155.000.

Wetzig, Helmut: *See—*
Stapel, Gunter; Gober, Karl-Heinz; Leyck, Sigurd; Wetzig, Helmut; Birkner, Christian; Kesselring, Kurt; Christ, Bruno; Steiner, Klaus; and Schroder, Friedhelm, 4,618,605, Cl. 514-177.000.

Whirlpool Corporation: *See—*
Cuthbert, Victor W.; and Snider, Joel M., 4,618,193, Cl. 312-264.000.
Keane, James W., 4,618,195, Cl. 339-16.00R.
Schwaderer, John R.; and Kristof, Mark J., 4,618,756, Cl. 219-10.55R.

White, Billy W., to Halliburton Company. Exoskeletal packaging scheme for circuit boards. 4,618,197, Cl. 339-17.00R.

White, Donald M., III: *See—*
Thorud, Richard A.; and White, Donald M., III, 4,617,747, Cl. 37-244.000.

White, Glenn S.; Mussler, Karl J.; and Van Exel, Gary A., to Rain Bird Consumer Products Mfg. Corp. Multiple pattern spray nozzle. 4,618,100, Cl. 239-440.000.

White, Ian A.: *See—*
Ludington, Paul D.; and White, Ian A., 4,618,212, Cl. 350-96.210.

White, Lawrence K.; Miszkowski, Nancy A.; and Levine, Aaron W., to RCA Corporation. Absorptive layer for optical lithography. 4,618,565, Cl. 430-271.000.

White, Lionel S.: *See—*
Tran, Bao G.; Neal, Joseph H.; and White, Lionel S., 4,618,947, Cl. 365-230.000.

White, William T.: *See—*
Keller, Vernon W.; Owen, Robert B.; Elkins, Bobby R.; and White, William T., 4,618,215, Cl. 350-319.000.

Whitehead, Edwin N. Security filament for use in identification cards. 4,618,167, Cl. 283-75.000.

Whitley, George J.: *See—*
Carrell, Ross M.; and Whitley, George J., 4,617,731, Cl. 29-861.000.

Whittaker Corporation: *See—*
Grebe, Alfred H., 4,617,690, Cl. 5-453.000.

Whyman, Robin: *See—*
Head, Robert A.; and Whyman, Robin, 4,618,628, Cl. 518-700.000.

Wiedemann, Erwin: *See—*
Liebert, Karl-Heinz; and Wiedemann, Erwin, 4,618,017, Cl. 180-133.000.

Wiendl, Heinz: *See—*
Meisel, Michael; and Wiendl, Heinz, 4,618,923, Cl. 363-144.000.

Wiessner, Edgar; Harbauer, Werner; and Paul, Klaus-Dieter, to Siemens Aktiengesellschaft. Reversing contactor for a three-phase motor. 4,618,807, Cl. 318-280.000.

Wietrzynski, Bolko: *See—*
Brinkmann, Gerhard; and Wietrzynski, Bolko, 4,618,275, Cl. 400-76.000.

Wilczewski, Robert H.: *See—*
Blomquist, James E.; and Wilczewski, Robert H., 4,618,276, Cl. 400-124.000.

Wilgood Corporation: *See—*
Feller, Murray F., 4,618,266, Cl. 374-41.000.

Willbanks, Marion A.: *See—*
Hollinshead, Clive; and Willbanks, Marion A., 4,618,419, Cl. 210-167.000.

Wm. T. Burnett & Co., Inc.: *See—*
Buchanan, Michael S., 4,618,629, Cl. 521-76.000.

Williams, Keith R., to Sundstrand Corporation. Multi-function valve. 4,617,797, Cl. 60-444.000.

Williams, Robert A. Wind operated apparatus. 4,618,312, Cl. 416-119.000.

Williams, Tim: *See—*
Little, Wendell; and Williams, Tim, 4,618,946, Cl. 365-189.000.

Willis, John G., to Mobil Solar Energy Corporation. Method for electrically interconnecting solar cells. 4,617,722, Cl. 29-572.000.

Wilson, John F.: *See—*
Gjertsen, Robert K.; Wilson, John F.; and Weiland, Walter F., Jr., 4,618,472, Cl. 376-446.000.

Wilson, Joseph H.; Lasiter, David N.; and McKee, Randall G., to Medical Safetec, Inc. Hospital waste disposal system. 4,618,103, Cl. 241-41.000.

Wilson, Michael A., to Maranantha Research Ltd. Proximity sensor oscillator utilizing controlled charge. 4,618,835, Cl. 331-65.000.

Winiecki, Alan L.: *See—*
Burke, William F.; and Winiecki, Alan L., 4,618,267, Cl. 374-50.000.

Winter, Roland A. E.: *See—*
Dexter, Martin; and Winter, Roland A. E., 4,618,638, Cl. 524-208.000.

Wiscombe, Nathan, to Storage Technology Partners. System for parallel power supplies. 4,618,779, Cl. 307-60.000.

Witt, Jurgen: *See—*
Sturm, Walter; Becker, Helmut; Witt, Jurgen; Fritz, Werner; and Eysholdt, Ursula, 4,618,776, Cl. 250-372.000.

Wittekind, Jurgen: *See—*
Gloria, Karl F. L.; Costinescu-Tataranu, Alexandru B.; Schuster, Wilhelm; and Wittekind, Jurgen, 4,618,282, Cl. 405-53.000.

Wittrock, Paul M.: *See—*
Porteous, Don D.; and Wittrock, Paul M., 4,617,950, Cl. 132-91.000.

Woerner, William C.: *See—*
Jahnke, Richard W.; and Woerner, William C., 4,618,539, Cl. 428-470.000.

Wolf Engineering Corporation: *See—*
Holtslander, Roger A., 4,618,817, Cl. 323-322.000.

Wolf, Hans: *See—*
Weiss, Wolfram; Balzer, Wolf-Dieter; Fikentscher, Rolf; Immel, Guenther; and Wolf, Hans, 4,618,371, Cl. 106-263.000.

Wolf, Hans-Jurgen: *See—*
Rattunde, Manfred; Steuer, Herbert K.; and Wolf, Hans-Jurgen, 4,618,338, Cl. 474-245.000.

Wolf, Michael L.: *See—*
Cartmell, James V.; Allaire, Michael J.; and Wolf, Michael L., 4,617,935, Cl. 128-641.000.

Wong, Patrick S. L.: *See—*
DuBois, Mark; Theeuwes, Felix; and Wong, Patrick S. L., 4,618,487, Cl. 424-15.000.

Wood, Donald L.; and Fried, Herbert E., to Shell Oil Company. Waste-paper deinking process. 4,618,400, Cl. 162-5.000.

Woodley, George M., to King Instrument Corporation. Tape staking and control apparatus. 4,617,719, Cl. 29-564.600.

Woolf, Robert M., to Kroger Co., The. Two belted supermarket checkout system. 4,618,032, Cl. 186-61.000.

Wright, Bruce R. Video editing system. 4,618,895, Cl. 358-311.000.

Wright, Raymond L., to Eastern Company, The. Nut member and mine roof support system incorporating same. 4,618,291, Cl. 405-261.000.

Wrobel, Gunter: *See—*
Papst, Georg; and Wrobel, Gunter, 4,618,315, Cl. 417-354.000.

Wrobleski, David L.; Mienko, David K.; and Leigh-Monstevens, Keith V., to Automotive Products plc. Hydraulic slave cylinder switch. 4,617,855, Cl. 92-5.00R.

Wu, Frank, to Sandoz Ltd. Heterocyclic esters of phenoxybenzoic acids useful as herbicides. 4,618,359, Cl. 71-88.000.

Wu, Philip T.: *See—*
Aipperspach, Anthony G.; Fitzgerald, Joseph M.; and Wu, Philip T., 4,618,943, Cl. 365-104.000.

Wutka, Anthony D.: *See—*
Judge, Robert L.; and Wutka, Anthony D., 4,618,292, Cl. 406-19.000.

Xerox Corporation: *See—*
Buchar, Wayne A., 4,618,248, Cl. 355-14.00R.
Hays, Dan A.; and Wayman, William H., 4,618,241, Cl. 355-3.0DD.
Knapp, John F., 4,618,243, Cl. 355-4.000.
Silverberg, Morton, 4,618,138, Cl. 271-245.000.
Stolka, Milan; Pai, Damodar M.; Smith, Thomas W.; Duff, James M.; and Loutfy, Rafik O., 4,618,551, Cl. 430-58.000.

Xomox Corporation: *See—*
Sandling, Michael J., 4,617,957, Cl. 137-315.000.

Yale University: *See—*
Pawelek, John M., 4,618,484, Cl. 424-1.100.

Yamada, Hisafumi; Kurik, Choei; and Saito, Junya, to Sony Corporation. Reference time detecting circuit. 4,618,891, Cl. 358-153.000.

Yamada, Kazuji: *See—*
Shimizu, Isao; and Yamada, Kazuji, 4,618,397, Cl. 156-628.000.

Yamada, Shigeki: *See—*
Shizuka, Masayuki; and Yamada, Shigeki, 4,618,793, Cl. 310-232.000.

Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, to Hitachi, Ltd.; Hitachi Koki Co.; and Hitachi Seiko Ltd. Ink jet recording apparatus. 4,618,868, Cl. 346-75.000.

Yamada, Tetsuo, to Kabushiki Kaisha Toshiba. Solid state imaging device. 4,618,874, Cl. 357-30.000.

Yamada, Yutaka, to Nippondenso Co., Ltd.; and Yamada, Yutaka. Check valve assembly for pipeline system. 4,617,959, Cl. 137-512.100.
Yamagishi, Jun: *See*—
Kagiyama, Tsutomu; Kobayashi, Fumio; Yamagishi, Jun; and Nishikawa, Hiromitsu, 4,617,757, Cl. 49-280.000.
Yamagishi, Toshio, to Sharp Kabushiki Kaisha. Heat fixing device for a copying machine. 4,618,242, Cl. 355-3.0FU.
Yamaguchi, Akihiro: *See*—
Yamaguchi, Keizaburo; Sugimoto, Kenichi; Tanabe, Yoshimitsu; Kawashima, Saburo; and Yamaguchi, Akihiro, 4,618,714, Cl. 564-329.000.
Yamaguchi, Keizaburo; Sugimoto, Kenichi; Tanabe, Yoshimitsu; Kawashima, Saburo; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Inc. Process for preparation of 3,3'- or 3,4'-diaminobenzophenones. 4,618,714, Cl. 564-329.000.
Yamaguchi, Yoshiaki: *See*—
Kanematu, Tetuo; and Yamaguchi, Yoshiaki, 4,618,491, Cl. 424-81.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Aoi, Kazuo; and Tsuchida, Naoki, 4,617,881, Cl. 123-90.270.
Oshiro, Nobuaki; and Futakuchi, Yorio, 4,617,885, Cl. 123-192.00B.
Watanabe, Masae, 4,618,187, Cl. 301-56.000.
Yoshikawa, Masaaki, 4,617,896, Cl. 123-432.000.
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakakiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha. System for controlling a power transmission of a four-wheel drive vehicle. 4,617,840, Cl. 74-865.000.
Yamamoto, Hideaki: *See*—
Sasano, Akira; Seki, Kouichi; Yamamoto, Hideaki; Baji, Toru; and Tsukada, Toshihisa, 4,618,873, Cl. 357-23.700.
Yamamoto, Hideomi; Watanabe, Haruzo; Kishie, Hidehiko; and Nishihara, Toshio, to Matsushita Electric Works, Ltd. Composite member comprising metallic sheet bent to be arcuate in section and rigid synthetic resin coating. 4,617,717, Cl. 29-527.400.
Yamamoto, Koichi, to Mazda Motor Corporation. Control for automatic transmissions. 4,618,042, Cl. 192-0.044.
Yamamoto, Michihiro, to Sumitomo Chemical Company, Limited. Novel 5-substituted 1,2,4,-oxadiazole derivatives and preparation thereof. 4,618,617, Cl. 514-364.000.
Yamamoto, Mikio: *See*—
Noguchi, Matsusaburo; Yamamoto, Mikio; and Kojima, Tetsuji, 4,618,250, Cl. 355-15.000.
Yamamura, Takemi; Tokuse, Masahiro; and Waku, Yoshiharu, to UBE Industries, Ltd. Inorganic fiber-reinforced ceramic composite material. 4,618,529, Cl. 428-224.000.
Yamanashi, Masanao: *See*—
Suzuki, Nobuyuki; Tanaka, Kenichi; and Yamanashi, Masanao, 4,617,979, Cl. 164-97.000.
Yamano, Shoji; Mikata, Yoshitaka; Teramoto, Osamu; and Nishide, Kazuhiro, to Yamato Scale Company, Limited. Combination weighing machine. 4,618,012, Cl. 177-25.000.
Yamano, Shoji; Mikata, Yoshitaka; Teramoto, Osamu; and Nishide, Kazuhiro, to Yamato Scale Company, Limited. Combination weighing machine with auxiliary weight hopper. 4,618,013, Cl. 177-25.000.
Yamanouchi, Katsuto; Saitoh, Katsuo; Saito, Yoshinori; and Kikyohara, Tadashi, to Nissan Motor Co., Ltd.; and Atsugi Motor Parts Co., Ltd. Fuel filter for diesel engine. 4,618,417, Cl. 210-149.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; and Tomioka, Kenichi, 4,618,627, Cl. 514-678.000.
Yamasaki, Masafumi: *See*—
Maitani, Yoshihisa; Tsunefuji, Katsuhiko; and Yamasaki, Masafumi, 4,618,238, Cl. 354-431.000.
Yamashita, Koji: *See*—
Miyasaka, Eiji; Hirose, Iwao; Yamashita, Koji; Kawai, Kenji; and Kanada, Eiji, 4,618,255, Cl. 355-71.000.
Yamatake-Honeywell Co. Limited: *See*—
Fujiwara, Masatoshi; and Kuroda, Masato, 4,617,952, Cl. 137-85.000.
Yamato, Akihiro: *See*—
Otobe, Yutaka; and Yamato, Akihiro, 4,617,901, Cl. 123-489.000.
Yamato Scale Company, Limited: *See*—
Yamano, Shoji; Mikata, Yoshitaka; Teramoto, Osamu; and Nishide, Kazuhiro, 4,618,012, Cl. 177-25.000.
Yamano, Shoji; Mikata, Yoshitaka; Teramoto, Osamu; and Nishide, Kazuhiro, 4,618,013, Cl. 177-25.000.
Yamatsuta, Kiichi: *See*—
Ohe, Junya; Wakita, Saburo; Yamatsuta, Kiichi; Goto, Shoji; Kutsukake, Yukinori; and Sugizaki, Masuo, 4,618,474, Cl. 420-436.000.
Yanagawa, Hitoshi; Nagasawa, Takeshi; Inoue, Shunzo; Iwaya, Toshio; and Murata, Shinji, to Canon Kabushiki Kaisha. Recording apparatus. 4,618,251, Cl. 355-28.000.
Yanagishita, Hitoshi: *See*—
Sato, Atsushi; Endo, Keiji; Kawakami, Shigenobu; Yanagishita, Hitoshi; and Hayashi, Shozo, 4,618,914, Cl. 361-315.000.
Yang, James C. H. Combination can opener. 4,617,842, Cl. 81-3.090.
Yashiki, Yuichi, to Canon Kabushiki Kaisha. Process of making electrophotographic photosensitive member. 4,618,559, Cl. 430-127.000.
Yasuhara, Seishi: *See*—
Hirano, Yutaka; Inoue, Kazuo; and Yasuhara, Seishi, 4,617,902, Cl. 123-501.000.
Yates, Martyn R. G., to Production Techniques Limited. Pump for pumping corrosive fluids. 4,618,425, Cl. 210-416.100.
Yates, William W., to Westinghouse Electric Corp. Dynamoelectric machine with a laminated pole permanent magnet rotor. 4,618,792, Cl. 310-156.000.
Yatsu, Tadao; and Hinooka, Nobuya, to Mitsui Petrochemical Industries, Ltd. Method of making a multilayered container. 4,618,386, Cl. 156-242.000.
Yau, Chi L. Steerable wind-powered vehicle. 4,617,871, Cl. 114-39.000.
Yee, Harold H.; and Hudson, James F., to Hughes Aircraft Company. Air-line microwave coaxial reversing switch having diagonally switched path. 4,618,840, Cl. 333-105.000.
Yee, Joe T.: *See*—
Lee, Peter; Cheung, George F.; and Yee, Joe T., 4,618,917, Cl. 362-88.000.
Yester, Francis R., Jr.: *See*—
Gannon, Mark A.; Yester, Francis R., Jr.; and Gailus, Paul H., 4,618,836, Cl. 331-96.000.
Yochum, Michael. Rear swing arm assembly for three or four wheeled off-the-road vehicle track conversion unit. 4,618,015, Cl. 180-9.210.
Yokota, Koji: *See*—
Fujitani, Yoshiyasu; Muraki, Hideaki; Yokota, Koji; Sobukawa, Hideo; and Matsunaga, Shinichi, 4,617,794, Cl. 60-274.000.
Yokoyama, Meiso; Takahashi, Makoto; Nishiwaki, Tsunehiko; and Imai, Makoto, to Nippon Seiki Co., Ltd. Gas detecting device. 4,617,821, Cl. 73-23.000.
Yokoyama, Michiyo: *See*—
Suzuki, Tetsumi; Murayama, Tetsuo; Ono, Hitoshi; Aramaki, Shinji; and Yokoyama, Michiyo, 4,618,555, Cl. 430-78.000.
Yokoyama, Naoki; and Ohshima, Toshio, to Fujitsu Limited. Process for fabricating heterojunction bipolar transistor with low base resistance. 4,617,724, Cl. 29-576.00B.
Yonezawa, Toshio: *See*—
Aoyama, Masaharu; Abe, Masahiro; Ajima, Takashi; and Yonezawa, Toshio, 4,618,878, Cl. 357-71.000.
Yoshida, Junichi; and Orimoto, Takashi, to Casio Computer Co., Ltd. Video game apparatus allowing for a variation in playing sequence. 4,618,146, Cl. 273-1.00E.
Yoshida Kogyo K. K.: *See*—
Ikemura, Akio; and Kajiki, Minoru, 4,617,805, Cl. 62-259.100.
Yoshida, Masao, to Kabushiki Gaisha Waizen. Forming a simulated halftone picture. 4,618,523, Cl. 428-189.000.
Yoshihara, Satoshi: *See*—
Takano, Katsuhiko; Iijima, Shigeharu; Yoshihara, Satoshi; Matsushima, Masaaki; Kishi, Hiroyoshi; and Sasamori, Eizo, 4,618,537, Cl. 428-336.000.
Yoshii, Shizuka: *See*—
Hatakeyama, Iwao; Maeda, Yasushi; Ishii, Osamu; and Yoshii, Shizuka, 4,618,901, Cl. 360-114.000.
Yoshikawa, Eiichi, to Laurel Bank Machine Co., Ltd. Bill paying machine. 4,618,072, Cl. 221-2.000.
Yoshikawa, Masaaki, to Yamaha Hatsudoki Kabushiki Kaisha. Internal combustion engine having three intake valves per cylinder. 4,617,896, Cl. 123-432.000.
Yoshimura, Motomu: *See*—
Matsumura, Mitsuie; Yoshimura, Motomu; and Urushibata, Hiroaki, 4,618,543, Cl. 429-19.000.
Yoshinari, Jiro: *See*—
Morita, Haruyuki; Yoshinari, Jiro; and Nakayama, Masatoshi, 4,618,542, Cl. 428-694.000.
Yoshino, Eiji: *See*—
Yamada, Takahiro; Namekawa, Satoshi; Yoshino, Eiji; and Matsuda, Yasumasa, 4,618,868, Cl. 346-75.000.
Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Araki, Kazuhiko; Ao, Hideki; Inui, Jun; and Aihara, Kenichi, 4,618,607, Cl. 514-212.000.
Yoshizaki, Kouji, to Toyota Jidosha Kabushiki Kaisha. Valve actuating apparatus for optionally resting the operation of a valve in internal combustion engine. 4,617,880, Cl. 123-90.160.
Young, Dean A.; and Koepke, Jeffery W., to Union Oil Company of California. Hydrocarbon conversion process with catalytically active amorphous silica. 4,618,738, Cl. 585-480.000.
Young, George E.: *See*—
Watt, George; and Young, George E., 4,618,347, Cl. 44-16.00F.
Young, Hartley F.; and Collins, John, to Ralph McKay Limited. Rail insulation pads. 4,618,093, Cl. 238-283.000.
Young, Mark S.; Drew, John; Shebanow, Michael C.; and Dujari, Vineet, to Advanced Micro Devices, Inc. Method and apparatus for reading a disk. 4,618,898, Cl. 360-51.000.
Youskites, Edward: *See*—
Berde, Dennis; and Youskites, Edward, 4,618,889, Cl. 358-144.000.
Yuchi, Sadataka, to Hochiki Corporation. Fire detector. 4,618,853, Cl. 340-505.000.
Yugen Kaisha GO Chuzo Tekkosho: *See*—
Go, Seitaro, 4,618,169, Cl. 285-86.000.
Yukimoto, Sadao: *See*—
Kawakubo, Fumio; Takanoo, Miyako; Yukimoto, Sadao; and Isayama, Katsuhiko, 4,618,653, Cl. 525-404.000.
Kawakubo, Fumio; Takanoo, Miyako; Yukimoto, Sadao; and Isayama, Katsuhiko, 4,618,656, Cl. 525-404.000.
Yukumoto, Hideki: *See*—
Sakakibara, Koji; Haraguchi, Hiroshi; and Yukumoto, Hideki, 4,617,895, Cl. 123-425.000.
Yuyama, Yasuaki; Nakano, Junji; Kondo, Shyunichi; Sato, Hideo; and Sawada, Kenichi, to Fuji Photo Film Co., Ltd. Electrophotographic recording material comprises backing layer containing long-chain alkanoic acid metal salt. 4,618,553, Cl. 430-69.000.

Zahn, Wayne V.: *See*—
Pauley, Gregory L.; and Zahn, Wayne V., 4,617,753, Cl. 43-42.190.
Zahnradfabrik Altona-Elbe Hans Meyer GmbH & Co. KG: *See*—
Sassen, Heinrich, 4,618,046, Cl. 192-67.00P.
Zahnradfabrik Friedrichshafen, AG.: *See*—
Liebert, Karl-Heinz; and Wiedemann, Erwin, 4,618,017, Cl. 180-133.000.
Zaklady Produkcji Urzadzen Mechanicznych im. Janka Krasickiego "Elwo": *See*—
Saternus, Antoni; Miczek, Ludwik; and Bartnik, Mieczyslaw, 4,618,376, Cl. 134-26.000.
Zambon SpA: *See*—
Castaldi, Graziano; and Giordano, Claudio, 4,618,697, Cl. 560-56.000.
Zammarano, Alessandro. Device for the conservation and the time-distribution of food for animals. 4,617,874, Cl. 119-51.120.
Zanotti, Richard: *See*—
Pricone, Robert M.; Roberts, William N.; and Zanotti, Richard, 4,618,518, Cl. 428-40.000.
Zenith Electronics Corporation: *See*—
Campisi, Carl; and Kay, Brian D., 4,618,131, Cl. 269-32.000.
Zhabokrug, Ilya. Universal filter changer for theatrical lights. 4,618,918, Cl. 362-281.000.
Zimmerman, Patrick G.: *See*—
Chamberlain, Craig S.; Vesley, George F.; Zimmerman, Patrick G.; and McAllister, Jerome W., 4,618,525, Cl. 428-209.000.
Zingg, Walter, to Asulab A.S. Resonator vibrating in a thickness-shear mode. 4,618,798, Cl. 310-366.000.
Zott, Werner: *See*—
Gotz, Dieter; and Zott, Werner, 4,618,273, Cl. 384-606.000.
Zsoka nee Somkuti, Rzsebet: *See*—
Trinn, Maria; Kordik, Gabriella; Udvardy-Nagy nee Cserey Pechaany, Eva; Vida, Zsuzsanna; and Zsoka nee Somkuti, Rzsebet, 4,618,581, Cl. 435-119.000.
Zuckler, Karl, to Siemens Aktiengesellschaft. Vacuum switching tube with a coil for generating a magnetic field. 4,618,750, Cl. 200-144.00B.
Zygraich, Nathan: *See*—
Delgoffe, Jean-Claude; Lobmann, Michele; and Zygraich, Nathan, 4,618,493, Cl. 424-89.000.
501 Societe Civile de Recherches et d'Etudes Theraputiques: *See*—
Chazot, Guy; and Suck, Catherine, 4,618,601, Cl. 514-23.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF OCTOBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Cherrington, Martin D., to Reading & Bates Construction Co. Process for drilling underground arcuate paths and installing production casings, conduits, or flow pipes therein. Re. 32,267, Cl. 175-53.000.

Emerson Electric Co.: *See—*
Tuggle, Lloyd H.; Loyd, Ronald C.; and Walker, Lee R., Re. 32,266, Cl. 172-15.000.

Gordon, Paul, to Strategic Medical Research Corp. Therapeutic composition and method of therapeutically treating warm blooded animals therewith. Re. 32,268, Cl. 514-25.000.

Loyd, Ronald C.: *See—*
Tuggle, Lloyd H.; Loyd, Ronald C.; and Walker, Lee R., Re. 32,266, Cl. 172-15.000.

Reading & Bates Construction Co.: *See—*
Cherrington, Martin D., Re. 32,267, Cl. 175-53.000.

Strategic Medical Research Corp.: *See—*
Gordon, Paul, Re. 32,268, Cl. 514-25.000.

Tuggle, Lloyd H.; Loyd, Ronald C.; and Walker, Lee R., to Emerson Electric Co. Lawn edger. Re. 32,266, Cl. 172-15.000.

Walker, Lee R.: *See—*
Tuggle, Lloyd H.; Loyd, Ronald C.; and Walker, Lee R., Re. 32,266, Cl. 172-15.000.

LIST OF DESIGN PATENTEES

Advanced Technology Laboratories, Inc.: *See—*
LaCelle, LeRoy J.; Ungar, Joseph L.; and Selke, Gary J., 286,325, Cl. D24-1.100.

Aktiebolaget Volvo: *See—*
Sandberg, Ulf A., 286,278, Cl. D12-211.000.

AMC International ALFA Metalcraft Corporation: *See—*
Schultz, Horst, 286,253, Cl. D7-137.000.

American Commercial, Incorporated: *See—*
Blake, Alfred; and Lax, Michael, 286,241, Cl. D7-11.000.
Blake, Alfred; and Lax, Michael, 286,242, Cl. D7-11.000.
Blake, Alfred; and Lax, Michael, 286,243, Cl. D7-11.000.
Blake, Alfred; and Lax, Michael, 286,244, Cl. D7-11.000.
Blake, Alfred, 286,245, Cl. D7-13.000.
Blake, Alfred, 286,246, Cl. D7-13.000.
Blake, Alfred, 286,247, Cl. D7-13.000.
Blake, Alfred, 286,248, Cl. D7-13.000.

Asaki, James T., to ITT Corporation. Cordless combination handset and stand telephone set. 286,282, 10-21-86, Cl. D14-53.000.

AT&T Information Systems Inc.: *See—*
Danielson, David C.; and McGarvey, John N., 286,285, Cl. D14-60.000.

Atsumi, Kaname: *See—*
Matsuo, Jiro; and Atsumi, Kaname, 286,269, Cl. D10-31.000.

Barr, David A.; and Grae, Bernard A., to Tandy Corporation. Computer housing. 286,289, 10-21-86, Cl. D14-100.000.

Berfield, Robert C.; and Crevling, Robert L., Jr., to Shop-Vac Corporation. Tank for electric vacuum cleaner. 286,336, 10-21-86, Cl. D32-23.000.

Bianchi International: *See—*
Gregory, Wayne R., 286,315, Cl. D3-104.000.

Biondo, Barry. Automobile trunk lid replacement unit. 286,277, 10-21-86, Cl. D12-196.000.

Blake, Alfred; and Lax, Michael, to American Commercial, Incorporated. Champagne flute. 286,241, 10-21-86, Cl. D7-11.000.

Blake, Alfred; and Lax, Michael, to American Commercial, Incorporated. Goblet. 286,242, 10-21-86, Cl. D7-11.000.

Blake, Alfred; and Lax, Michael, to American Commercial, Incorporated. Wine glass. 286,243, 10-21-86, Cl. D7-11.000.

Blake, Alfred; and Lax, Michael, to American Commercial, Incorporated. Champagne glass. 286,244, 10-21-86, Cl. D7-11.000.

Blake, Alfred, to American Commercial, Incorporated. Champagne glass. 286,245, 10-21-86, Cl. D7-13.000.

Blake, Alfred, to American Commercial, Incorporated. Champagne flute. 286,246, 10-21-86, Cl. D7-13.000.

Blake, Alfred, to American Commercial, Incorporated. Wine glass. 286,247, 10-21-86, Cl. D7-13.000.

Blake, Alfred, to American Commercial, Incorporated. Goblet. 286,248, 10-21-86, Cl. D7-13.000.

Bourgeois, Bruce E. Mailing envelope. 286,300, 10-21-86, Cl. D19-3.000.

Braun Aktiengesellschaft: *See—*
Ullmann, Roland, 286,328, Cl. D28-49.000.

brother Kogyo Kabushiki Kaisha: *See—*
Itoh, Kazuo, 286,294, Cl. D15-132.000.

Buch, Roman. Instrument housing for a ski pole. 286,271, 10-21-86, Cl. D10-102.000.

Bulgari, Gianni, to Partecipazioni Bulgari S.p.A. Link for jewelry chain. 286,272, 10-21-86, Cl. D11-93.000.

Burton, Thelma R. Wall mounted holder for an electric curling iron, curling brush or the like. 286,238, 10-21-86, Cl. D6-573.000.

Carlson, Arthur R., to Decor Corporation Proprietary Ltd., The. Food bowl. 286,249, 10-21-86, Cl. D7-23.000.

Catania, Joseph J.; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, to Century Fireplace Furnishings, Inc. Fireplace screen. 286,322, 10-21-86, Cl. D23-138.300.

Catry, Benoit, to Fonderies Franco-Belges. Wood burning stove. 286,321, 10-21-86, Cl. D23-97.000.

Cavalet ApS: *See—*
Werk, Otto, 286,231, Cl. D3-72.000.

Century Fireplace Furnishings, Inc.: *See—*
Catania, Joseph J.; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 286,322, Cl. D23-138.300.

Christianson, Peter. Combined hog trough feeder and divider. 286,332, 10-21-86, Cl. D30-13.000.

Citizen Watch Co., Ltd.: *See—*
Matsuo, Jiro; and Atsumi, Kaname, 286,269, Cl. D10-31.000.

Clover Mfg. Co., Ltd.: *See—*
Okada, Hidekazu, 286,262, Cl. D9-303.000.

Clowe, Robert A.; and Gault, Robert L., to Xerox Corporation. Office copier processing cartridge. 286,297, 10-21-86, Cl. D16-32.000.

Cohen, Leonard; Feinberg, Martin R.; Knoepke, Eckhard; and Quinlan, William J., to Samsonite Corporation. Garment bag. 286,230, 10-21-86, Cl. D3-71.000.

Colgate-Palmolive Company: *See—*
Vesborg, Steen; and Jacobsen, Henrik, 286,266, Cl. D9-376.000.

Colight, Inc.: *See—*
May, Joe T.; and Hale, Steven D., 286,298, Cl. D16-39.000.

Collins, Scott J., to Wisconsin Tissue Mills, Inc. Paper towel cabinet. 286,235, 10-21-86, Cl. D6-522.000.

Collins, Scott J., to Wisconsin Tissue Mills, Inc. Paper towel dispensing cabinet. 286,236, 10-21-86, Cl. D6-522.000.

Colomac, James J., Jr. Solitaire game board. 286,306, 10-21-86, Cl. D21-57.000.

Corn, James F.: *See—*
Parks, James D.; Moss, Charles A.; Dyer, Kermit W.; and Corn, James F., 286,324, Cl. D23-151.000.

CPG Products Corp.: *See—*
Mayer, John F.; and Norton, John J., 286,308, Cl. D21-146.000.

Crevling, Robert L., Jr.: *See—*
Berfield, Robert C.; and Crevling, Robert L., Jr., 286,336, Cl. D32-23.000.

Cunningham, William T. Arm support for hand tool. 286,338, 10-21-86, Cl. D34-23.000.

Curver B.V.: *See—*
van Berne, Joost; and van der Vlies, Gerardus J., 286,339, Cl. D34-43.000.

Danielson, David C.; and McGarvey, John N., to AT&T Information Systems Inc. Telephone stand. 286,285, 10-21-86, Cl. D14-60.000.

Dart Industries Inc.: *See—*
Wolff, Martin J., 286,268, Cl. D9-447.000.

Davis, Edward P.; and Gallery, Michael J., to Dunlop Limited. Tire for a vehicle wheel. 286,274, 10-21-86, Cl. D12-146.000.

Decor Corporation Proprietary Ltd., The: *See—*
Carlson, Arthur R., 286,249, Cl. D7-23.000.

DeTuzzi, Russell: *See—*
Catania, Joseph J.; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 286,322, Cl. D23-138.300.

Diel, Robert L.: *See—*
Skinner, Jerald P.; Zlotky, Richard A.; and Diel, Robert L., 286,288, Cl. D14-91.000.

Dreisbach, Judy: *See*—
Maschal, John R.; and Dreisbach, Judy, 286,263, Cl. D9-322.000.
Dunlop Limited: *See*—
Davis, Edward P.; and Gallery, Michael J., 286,274, Cl. D12-146.000.
Dyer, Kermit W.: *See*—
Parks, James D.; Moss, Charles A.; Dyer, Kermit W.; and Corn, James F., 286,324, Cl. D23-151.000.
EBRO Espalier Limited: *See*—
Evans, Eric R., 286,259, Cl. D8-1.000.
Electronic Instrumentation & Technology: *See*—
May, Joe T.; and Hale, Steven D., 286,298, Cl. D16-39.000.
Ellis, Gary R. Carrier for a child. 286,227, 10-21-86, Cl. D3-32.000.
Emmons, Vera E.: *See*—
Rupp, Joretta; and Emmons, Vera E., 286,310, Cl. D21-175.000.
Evans, Eric R., to EBRO Espalier Limited. Espalier frame. 286,259, 10-21-86, Cl. D8-1.000.
Fain, Virginia K. Long stem Valentine card. 286,301, 10-21-86, Cl. D19-6.000.
Fassauer, Arthur L. Combination food and water pet feeder. 286,333, 10-21-86, Cl. D30-16.000.
Feinberg, Martin R.: *See*—
Cohen, Leonard; Feinberg, Martin R.; Knoepke, Eckhard; and Quinlan, William J., 286,230, Cl. D3-71.000.
Knoepke, Eckhard; and Feinberg, Martin R., 286,229, Cl. D3-48.000.
Fisher, Richard E. Combined children's bed, storage unit and amusement center. 286,232, 10-21-86, Cl. D6-384.000.
Fonderies Franco-Belges: *See*—
Catry, Benoit, 286,321, Cl. D23-97.000.
Gage, Eugene M. Camp stove leveler frame. 286,255, 10-21-86, Cl. D7-332.000.
Gallery, Michael J.: *See*—
Davis, Edward P.; and Gallery, Michael J., 286,274, Cl. D12-146.000.
Gardner, Maxwell: *See*—
Catania, Joseph J.; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 286,322, Cl. D23-138.300.
Gaudino, Angelo: *See*—
Catania, Joseph J.; Gaudino, Angelo; DeTuzzi, Russell; and Gardner, Maxwell, 286,322, Cl. D23-138.300.
Gault, Robert L.: *See*—
Clowe, Robert A.; and Gault, Robert L., 286,297, Cl. D16-32.000.
Gautam, Anil S. Tongue cleaner or similar article. 286,326, 10-21-86, Cl. D24-28.000.
Germain, Robert A., to USM Corporation. Design for spreader agitator. 286,293, 10-21-86, Cl. D15-28.000.
Goodwin, Raymond, to International Leisuretime Products, Inc. Combined cooler chest and radio. 286,252, 10-21-86, Cl. D7-77.000.
Grae, Bernard A.: *See*—
Barr, David A.; and Grae, Bernard A., 286,289, Cl. D14-100.000.
Grange, Kenneth H., to Thorn Emi Domestic Appliances Limited. Food mixer. 286,258, 10-21-86, Cl. D7-379.000.
Gregory, Wayne R., to Bianchi International. Ammunition magazine pouch. 286,315, 10-21-86, Cl. D3-104.000.
GTE Telenet Communications Corporation: *See*—
Skigen, Jeffrey A.; Lum, James C. P.; and Taylor, C. Thomas, 286,286, Cl. D14-62.000.
Hale, Steven D.: *See*—
May, Joe T.; and Hale, Steven D., 286,298, Cl. D16-39.000.
Halm, Hans, to Wilkinson Sword Limited. Razor. 286,327, 10-21-86, Cl. D28-45.000.
Hara, Kunio; and Okuyama, Tooru, to Kabushiki Kaisha Toshiba. Electronic copying machine. 286,295, 10-21-86, Cl. D16-31.000.
Hara, Kunio; and Okuyama, Tooru, to Kabushiki Kaisha Toshiba. Scanner for electronic copying machine. 286,296, 10-21-86, Cl. D16-32.000.
Haworth, Brian D., to S. C. Johnson & Son, Inc. Air freshener dispenser. 286,323, 10-21-86, Cl. D23-150.000.
HGM, Inc.: *See*—
Holtman, Steve H.; and Nelson, George A., 286,280, Cl. D13-19.000.
Hollibaugh Manufacturing Company, Inc.: *See*—
Kingston, James E., 286,292, Cl. D15-9.000.
Kingston, James E., 286,320, Cl. D23-88.000.
Holtman, Steve H.; and Nelson, George A., to HGM, Inc. Housing for connecting a medical argon laser to a laser probe. 286,280, 10-21-86, Cl. D13-19.000.
Hosiden Electronics Co., Ltd: *See*—
Sekiguchi, Shigemi, 286,281, Cl. D13-24.000.
Huang, Tien T. Combined pen, watch and pressure gauge. 286,270, 10-21-86, Cl. D10-86.000.
Igloo Corporation: *See*—
Katz, Stanley A., 286,264, Cl. D9-367.000.
Innovative Concepts, Inc.: *See*—
Long, Jerry M.; and Womack, James A., 286,228, Cl. D3-35.000.
International Leisuretime Products, Inc.: *See*—
Goodwin, Raymond, 286,252, Cl. D7-77.000.
Irwin, James. T-shirt. 286,220, 10-21-86, Cl. D2-209.000.
Itoh, Kazuo, to brother Kogyo Kabushiki Kaisha. Machine used for drilling, tapping and milling, and having an automatic tool changing system. 286,294, 10-21-86, Cl. D15-132.000.
ITT Corporation: *See*—
Asaki, James T., 286,282, Cl. D14-53.000.
J. C. Roy Company, Inc.: *See*—
Roy, Joseph C., 286,307, Cl. D21-114.000.
Jacobsen, Henrik: *See*—
Vesborg, Steen; and Jacobsen, Henrik, 286,266, Cl. D9-376.000.
Janome Sewing Machine Co., Ltd.: *See*—
Kuroki, Nobufusa, 286,291, Cl. D14-111.000.
JM^{10}: *See*—
Maschal, John R.; and Dreisbach, Judy, 286,263, Cl. D9-322.000.
Jung, Kwan S. Barbecue grill. 286,256, 10-21-86, Cl. D7-334.000.
Kabushiki Kaisha Toshiba: *See*—
Hara, Kunio; and Okuyama, Tooru, 286,295, Cl. D16-31.000.
Hara, Kunio; and Okuyama, Tooru, 286,296, Cl. D16-32.000.
Kabushiki Kaisha Tsuzuki Seisakujo: *See*—
Tsuzuki, Kiyohiko, 286,312, Cl. D21-198.000.
Katoh, Mitsuo; and Tadano, Junpei, to Toyota Jidosha Kabushiki Kaisha. Radiator grille for an automobile. 286,275, 10-21-86, Cl. D12-163.000.
Katz, Stanley A., to Igloo Corporation. Container for refrigerant gel or the like. 286,264, 10-21-86, Cl. D9-367.000.
Kingston, James E., to Hollibaugh Manufacturing Company, Inc. Air compressor for tubs and the like. 286,292, 10-21-86, Cl. D15-9.000.
Kingston, James E., to Hollibaugh Manufacturing Company, Inc. Water heater for tubs, swimming pools and the like. 286,320, 10-21-86, Cl. D23-88.000.
Kinryu Cutlery Mfg. Co., Ltd.: *See*—
Sawa, Minoru, 286,314, Cl. D22-118.000.
Knoepke, Eckhard; and Feinberg, Martin R., to Samsonite Corporation. Luggage case. 286,229, 10-21-86, Cl. D3-48.000.
Knoepke, Eckhard: *See*—
Cohen, Leonard; Feinberg, Martin R.; Knoepke, Eckhard; and Quinlan, William J., 286,230, Cl. D3-71.000.
Kouby, Syl: *See*—
Prescott, Earl H., 286,250, Cl. D7-27.000.
Kuroki, Nobufusa, to Janome Sewing Machine Co., Ltd. Printer. 286,291, 10-21-86, Cl. D14-111.000.
Kurzweil, Robert J., to Walt Disney Productions. Amusement ride. 286,313, 10-21-86, Cl. D21-249.000.
Labconco Corporation: *See*—
Parks, James D.; Moss, Charles A.; Dyer, Kermit W.; and Corn, James F., 286,324, Cl. D23-151.000.
LaCelle, LeRoy J.; Ungar, Joseph L.; and Selke, Gary J., to Advanced Technology Laboratories, Inc. Medical ultrasound scanner. 286,325, 10-21-86, Cl. D24-1.100.
Lax, Michael: *See*—
Blake, Alfred; and Lax, Michael, 286,241, Cl. D7-11.000.
Blake, Alfred; and Lax, Michael, 286,242, Cl. D7-11.000.
Blake, Alfred; and Lax, Michael, 286,243, Cl. D7-11.000.
Blake, Alfred; and Lax, Michael, 286,244, Cl. D7-11.000.
Leggett, Harold B. Game board. 286,305, 10-21-86, Cl. D21-25.000.
Lippert Corporation: *See*—
Muderlak, Kenneth J., 286,237, Cl. D6-525.000.
Long, Jerry M.; and Womack, James A., to Innovative Concepts, Inc. Diskette storage container for holding a plurality of diskettes. 286,228, 10-21-86, Cl. D3-35.000.
Lum, James C. P.: *See*—
Skigen, Jeffrey A.; Lum, James C. P.; and Taylor, C. Thomas, 286,286, Cl. D14-62.000.
Maher, Robert R. Boat hull and deck. 286,279, 10-21-86, Cl. D12-313.000.
Martinell, Steven W.: *See*—
Martinell, William J.; and Martinell, Steven W., 286,311, Cl. D21-195.000.
Martinell, William J.; and Martinell, Steven W., to Pro Form, Inc. Rowing machine. 286,311, 10-21-86, Cl. D21-195.000.
Maschal, John R.; and Dreisbach, Judy, to JM^{10}. Simulative box. 286,263, 10-21-86, Cl. D9-322.000.
Mathis, Cleo D. Guard for a water suction pipe. 286,319, 10-21-86, Cl. D23-41.000.
Matsuda, Kei: *See*—
Sasaki, Yoshio; Nishimura, Toshio; and Matsuda, Kei, 286,284, Cl. D14-53.000.
Matsuo, Jiro; and Atsumi, Kaname, to Citizen Watch Co., Ltd. Combined wristwatch and radio. 286,269, 10-21-86, Cl. D10-31.000.
May, Joe T.; and Hale, Steven D., to Colight, Inc.; and Electronic Instrumentation & Technology. Integrating photometer. 286,298, 10-21-86, Cl. D16-39.000.
Mayer, John F.; and Norton, John J., to CPG Products Corp. Combined toy gun and carrying case. 286,308, 10-21-86, Cl. D21-146.000.
McGarvey, John N.: *See*—
Danielson, David C.; and McGarvey, John N., 286,285, Cl. D14-60.000.
Mednis, Juris M., to Universal Symetrics Corporation. Bottle or the like. 286,265, 10-21-86, Cl. D9-367.000.
Mens, Gerardus F. Support for flower pots. 286,234, 10-21-86, Cl. D6-404.000.
Moss, Charles A.: *See*—
Parks, James D.; Moss, Charles A.; Dyer, Kermit W.; and Corn, James F., 286,324, Cl. D23-151.000.
Motorola, Inc.: *See*—
Toth, Richard J.; and Selinko, George J., 286,287, Cl. D14-68.000.
Muderlak, Kenneth J., to Lippert Corporation. Combined accessory holder and grab bar unit for a tub and shower. 286,237, 10-21-86, Cl. D6-525.000.
Murray, John T., II. Pilot's training visor. 286,221, 10-21-86, Cl. D2-514.000.
Nelson, George A.: *See*—
Holtman, Steve H.; and Nelson, George A., 286,280, Cl. D13-19.000.

Nichols, Stephen A., to Uniden Corporation of America. Cordless telephone assembly. 286,283, 10-21-86, Cl. D14-53.000.
Nippon Light Metal Company Limited: *See*—
Uesaka, Susumu, 286,257, Cl. D7-368.000.
Nishida, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Season ticket issuing machine. 286,290, 10-21-86, Cl. D14-104.000.
Nishimura, Toshio: *See*—
Sasaki, Yoshio; Nishimura, Toshio; and Matsuda, Kei, 286,284, Cl. D14-53.000.
Nitsuko Limited: *See*—
Sasaki, Yoshio; Nishimura, Toshio; and Matsuda, Kei, 286,284, Cl. D14-53.000.
Nordic Products, Inc.: *See*—
Rankin, John, 286,260, Cl. D8-14.000.
Norton, John J.: *See*—
Mayer, John F.; and Norton, John J., 286,308, Cl. D21-146.000.
Okada, Hidekazu, to Clover Mfg. Co., Ltd. Container for knitting needles. 286,262, 10-21-86, Cl. D9-303.000.
Okuyama, Tooru: *See*—
Hara, Kunio; and Okuyama, Toora, 286,295, Cl. D16-31.000.
Hara, Kunio; and Okuyama, Toora, 286,296, Cl. D16-32.000.
Orlick, Lance; and Parlatore, Kenneth. Fluorescent lure. 286,317, 10-21-86, Cl. D22-127.000.
Park, Hong K. Trammel head. 286,303, 10-21-86, Cl. D19-99.000.
Parks, James D.; Moss, Charles A.; Dyer, Kermit W.; and Corn, James F., to Labconco Corporation. Laboratory fume hood. 286,324, 10-21-86, Cl. D23-151.000.
Parlatore, Kenneth: *See*—
Orlick, Lance; and Parlatore, Kenneth, 286,317, Cl. D22-127.000.
Partecipazioni Bulgari S.p.A.: *See*—
Bulgari, Gianni, 286,272, Cl. D11-93.000.
Passien, Ray. Sprayer. 286,318, 10-21-86, Cl. D23-18.000.
Peavey Electronics Corp.: *See*—
Peavey, Hartley D., 286,299, Cl. D17-20.000.
Peavey, Hartley D., to Peavey Electronics Corp. Guitar body or similar article. 286,299, 10-21-86, Cl. D17-20.000.
Penalber, Crafton L.: *See*—
Penalber, Crafton R., 286,316, Cl. D22-129.000.
Penalber, Crafton R., to Penalber, Crafton L. Fishing bait. 286,316, 10-21-86, Cl. D22-129.000.
Pozzi, Ambrogio, to Rosenthal Aktiengesellschaft Rechtsabteilung. Vase. 286,273, 10-21-86, Cl. D11-143.000.
Prescott, Earl H., to Kouby, Syl; and Tuttle, Scarlett P. Combined food plate and beverage container holder. 286,250, 10-21-86, Cl. D7-27.000.
Pro Form, Inc.: *See*—
Martinell, William J.; and Martinell, Steven W., 286,311, Cl. D21-195.000.
Quinlan, William J.: *See*—
Cohen, Leonard; Feinberg, Martin R.; Knoepke, Eckhard; and Quinlan, William J., 286,230, Cl. D3-71.000.
Rankin, John, to Nordic Products, Inc. Holder for sterilizing jar lids or similar articles. 286,260, 10-21-86, Cl. D8-14.000.
Rosenthal Aktiengesellschaft Rechtsabteilung: *See*—
Pozzi, Ambrogio, 286,273, Cl. D11-143.000.
Rotpunkt Dr. Anso Zimmermann: *See*—
Zimmerman, Anso, 286,254, Cl. D7-317.000.
Roy, Joseph C., to J. C. Roy Company, Inc. Playhouse. 286,307, 10-21-86, Cl. D21-114.000.
Rupp, Joretta; and Emmons, Vera E. Doll. 286,310, 10-21-86, Cl. D21-175.000.
S.A.S. Ventures, Inc.: *See*—
Scoccola, Dominic L., 286,331, Cl. D28-78.000.
S. C. Johnson & Son, Inc.: *See*—
Haworth, Brian D., 286,323, Cl. D23-150.000.
Saab-Scania Aktiebolag: *See*—
Vahlenbreder, Aribert, 286,276, Cl. D12-163.000.
Samsonite Corporation: *See*—
Cohen, Leonard; Feinberg, Martin R.; Knoepke, Eckhard; and Quinlan, William J., 286,230, Cl. D3-71.000.
Knoepke, Eckhard; and Feinberg, Martin R., 286,229, Cl. D3-48.000.
Sandberg, Ulf A., to Aktiebolaget Volvo. Wheel. 286,278, 10-21-86, Cl. D12-211.000.
Sasaki, Yoshio; Nishimura, Toshio; and Matsuda, Kei, to Nitsuko Limited. Telephone set. 286,284, 10-21-86, Cl. D14-53.000.
Satterfield, Roy E. Notion tray. 286,240, 10-21-86, Cl. D7-5.000.
Sawa, Minoru, to Kinryu Cutlery Mfg. Co., Ltd. Knife handle. 286,314, 10-21-86, Cl. D22-118.000.
Scheurer, Robert S.; and Scheurer, Stephen. Head cushion. 286,239, 10-21-86, Cl. D6-601.000.
Scheurer, Stephen: *See*—
Scheurer, Robert S.; and Scheurer, Stephen, 286,239, Cl. D6-601.000.
Schneider, Bernard, to Tuboplast s.a. Cap for extrusion tubes and the like. 286,267, 10-21-86, Cl. D9-435.000.
Schreiner, Charles. Work station. 286,233, 10-21-86, Cl. D6-397.000.
Schultz, Horst, to AMC International ALFA Metalcraft Corporation. Article of flatware. 286,253, 10-21-86, Cl. D7-137.000.
Scoccola, Dominic L., to S.A.S. Ventures, Inc. Personal care compact. 286,331, 10-21-86, Cl. D28-78.000.
Seehase, Jack C. Belt buckle. 286,223, 10-21-86, Cl. D11-232.000.
Seehase, Jack C. Belt buckle. 286,224, 10-21-86, Cl. D11-232.000.
Seehase, Jack C. Belt buckle. 286,225, 10-21-86, Cl. D11-232.000.
Seehase, Jack C. Belt buckle. 286,226, 10-21-86, Cl. D11-232.000.
Sekiguchi, Shigemi, to Hosiden Electronics Co., Ltd. Electrical connecting socket. 286,281, 10-21-86, Cl. D13-24.000.
Selinko, George J.: *See*—
Toth, Richard J.; and Selinko, George J., 286,287, Cl. D14-68.000.
Selke, Gary J.: *See*—
LaCelle, LeRoy J.; Ungar, Joseph L.; and Selke, Gary J., 286,325, Cl. D24-1.100.
Shop-Vac Corporation: *See*—
Berfield, Robert C.; and Crevling, Robert L., Jr., 286,336, Cl. D32-23.000.
Shugar, Jenneye L. Adjustable library shelf. 286,302, 10-21-86, Cl. D19-34.100.
Skigen, Jeffrey A.; Lum, James C. P.; and Taylor, C. Thomas, to GTE Telenet Communications Corporation. Telephone stand. 286,286, 10-21-86, Cl. D14-62.000.
Skinner, Jerald P.; Zlotky, Richard A.; and Diel, Robert L. Satellite antenna mounting base. 286,288, 10-21-86, Cl. D14-91.000.
Smederod, Sten A. M. Curtain draping hook. 286,261, 10-21-86, Cl. D8-354.000.
Steyn, Izak K. Insulated container. 286,251, 10-21-86, Cl. D7-77.000.
Strohmeyer, Rolf, to Vorwerk & Co. Elektrowerke KG. Vacuum cleaner. 286,334, 10-21-86, Cl. D32-22.000.
Strohmeyer, Rolf, to Vorwerk & Co. Elektrowerke KG. Vacuum cleaner. 286,335, 10-21-86, Cl. D32-22.000.
Sussman, Howard. Compartmented tray for cosmetic organizer or the like. 286,329, 10-21-86, Cl. D28-73.000.
Sussman, Howard. Shelf unit for toiletries or the like. 286,330, 10-21-86, Cl. D28-73.000.
Tadano, Junpei: *See*—
Katoh, Mitsuo; and Tadano, Junpei, 286,275, Cl. D12-163.000.
Talbot, Brian N. Combined thermal hood and face mask for scuba divers. 286,222, 10-21-86, Cl. D29-15.000.
Tandy Corporation: *See*—
Barr, David A.; and Grae, Bernard A., 286,289, Cl. D14-100.000.
Taylor, C. Thomas: *See*—
Skigen, Jeffrey A.; Lum, James C. P.; and Taylor, C. Thomas, 286,286, Cl. D14-62.000.
Thorn Emi Domestic Appliances Limited: *See*—
Grange, Kenneth H., 286,258, Cl. D7-379.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Nishida, Yoshiaki, 286,290, Cl. D14-104.000.
Toth, Richard J.; and Selinko, George J., to Motorola, Inc. Radio pager or similar article. 286,287, 10-21-86, Cl. D14-68.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Katoh, Mitsuo; and Tadano, Junpei, 286,275, Cl. D12-163.000.
Tsuzuki, Kiyohiko, to Kabushiki Kaisha Tsuzuki Seisakujo. Grip exerciser. 286,312, 10-21-86, Cl. D21-198.000.
Tuboplast s.a.: *See*—
Schneider, Bernard, 286,267, Cl. D9-435.000.
Tuttle, Scarlett P.: *See*—
Prescott, Earl H., 286,250, Cl. D7-27.000.
Uesaka, Susumu, to Nippon Light Metal Company Limited. Icecream maker. 286,257, 10-21-86, Cl. D7-368.000.
Ullmann, Roland, to Braun Aktiengesellschaft. Electric dry shaver. 286,328, 10-21-86, Cl. D28-49.000.
Ungar, Joseph L.: *See*—
LaCelle, LeRoy J.; Ungar, Joseph L.; and Selke, Gary J., 286,325, Cl. D24-1.100.
Uniden Corporation of America: *See*—
Nichols, Stephen A., 286,283, Cl. D14-53.000.
Universal Symetrics Corporation: *See*—
Mednis, Juris M., 286,265, Cl. D9-367.000.
USM Corporation: *See*—
Germain, Robert A., 286,293, Cl. D15-28.000.
Vahlenbreder, Aribert, to Saab-Scania Aktiebolag. Front radiator grille for an automobile. 286,276, 10-21-86, Cl. D12-163.000.
van Berne, Joost; and van der Vlies, Gerardus J., to Curver B.V. Foldable tote box. 286,339, 10-21-86, Cl. D34-43.000.
van der Vlies, Gerardus J.: *See*—
van Berne, Joost; and van der Vlies, Gerardus J., 286,339, Cl. D34-43.000.
Vesborg, Steen; and Jacobsen, Henrik, to Colgate-Palmolive Company. Combined bottle and cap. 286,266, 10-21-86, Cl. D9-376.000.
Volney, Frank, Jr. Clown doll in a swing or the like. 286,309, 10-21-86, Cl. D21-173.000.
Vorwerk & Co. Elektrowerke KG: *See*—
Strohmeyer, Rolf, 286,334, Cl. D32-22.000.
Strohmeyer, Rolf, 286,335, Cl. D32-22.000.
Walt Disney Productions: *See*—
Kurzweil, Robert J., 286,313, Cl. D21-249.000.
Werk, Otto, to Cavalet ApS. Attache case. 286,231, 10-21-86, Cl. D3-72.000.
Wiens, Peter. Outdoor advertising sign. 286,304, 10-21-86, Cl. D20-39.000.
Wilkie, Frank A., Sr. Snow ski cleaning tool. 286,337, 10-21-86, Cl. D32-47.000.
Wilkinson Sword Limited: *See*—
Halm, Hans, 286,327, Cl. D28-45.000.
Wisconsin Tissue Mills, Inc.: *See*—
Collins, Scott J., 286,235, Cl. D6-522.000.
Collins, Scott J., 286,236, Cl. D6-522.000.
Wolff, Martin J., to Dart Industries Inc. Portion measuring insert for a container or the like. 286,268, 10-21-86, Cl. D9-447.000.
Womack, James A.: *See*—
Long, Jerry M.; and Womack, James A., 286,228, Cl. D3-35.000.
Xerox Corporation: *See*—
Clowe, Robert A.; and Gault, Robert L., 286,297, Cl. D16-32.000.
Zimmerman, Anso, to Rotpunkt Dr. Anso Zimmermann. Vacuum jug. 286,254, 10-21-86, Cl. D7-317.000.
Zlotky, Richard A.: *See*—
Skinner, Jerald P.; Zlotky, Richard A.; and Diel, Robert L., 286,288, Cl. D14-91.000.

LIST OF PLANT PATENTEES

Barberet, Nicole; and Ducloux, Yves, to Laboratoire de Physiologie Vegetale de la Londe. Carnation named Lonsimox. 5,793, 10-21-86, Cl. 82.000.

Ducloux, Yves: *See*—
Barberet, Nicole; and Ducloux, Yves, 5,793, Cl. 82.000.

Laboratoire de Physiologie Vegetale de la Londe: *See*—
Barberet, Nicole; and Ducloux, Yves, 5,793, Cl. 82.000.

McRae, Edward A., to Melridge Inc. Lily plant named Orange Pixie. 5,792, 10-21-86, Cl. 68.000.

Melridge Inc.: *See*—
McRae, Edward A., 5,792, Cl. 68.000.

Moore, Ralph S., to Sequoia Nursery. Rose Plant/Var. MORquake. 5,791, 10-21-86, Cl. 7.000.

Sequoia Nursery: *See*—
Moore, Ralph S., 5,791, Cl. 7.000.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 21, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

20 4,617,684
338 4,617,685
433 4,617,686

CLASS 4

213 4,617,687
420.2 4,617,688

CLASS 5

400 4,617,689
434 4,617,691
453 4,617,690

CLASS 7

158 4,617,692

CLASS 8

161 4,618,344

CLASS 15

104.3 SN 4,617,693
167 R 4,617,694
195 4,617,695
236 R 4,617,696

CLASS 16

110 R 4,617,697
228 4,617,698
262 4,617,699

CLASS 17

45 4,617,700
4,617,701

CLASS 23

293 R 4,618,345

CLASS 24

16 PB 4,617,702
68 CT 4,617,703
236 4,617,704
642 4,617,705

CLASS 27

28 4,617,706

CLASS 29

25.35 4,617,707
25.42 4,617,708
124 4,617,709
268 4,617,710
402.08 4,617,711
4,617,712
426.4 4,617,713
434 4,617,714
456 4,617,715
526 R 4,617,716
527.4 4,617,717
558 4,617,718
564.6 4,617,719
568 4,617,720
4,617,721
572 4,617,722
576 B 4,617,723
4,617,724
598 4,617,725
4,617,726
825 4,617,727
836 4,617,728
840 4,617,729
843 4,617,730
861 4,617,731
866 4,617,732
874 4,617,733

CLASS 30

120.1 4,617,734
151 4,617,735
169 4,617,736
273 4,617,737
339 4,617,738

CLASS 33

18.1 4,617,739
122 4,617,740
228 4,617,741

CLASS 34

57 A 4,617,742
109 4,617,743
168 4,617,744

CLASS 36

3 B 4,617,745
133 4,617,746

CLASS 37

244 4,617,747

CLASS 40

312 4,617,748

CLASS 42

16 4,617,749
65 4,617,750

CLASS 43

17.5 4,617,751
27.4 4,617,752
42.19 4,617,753
137 4,617,754

CLASS 44

1 A 4,618,346
16 F 4,618,347
51 4,618,348

CLASS 47

65 4,617,755

CLASS 49

212 4,617,756
280 4,617,757
324 4,617,758
487 4,617,759

CLASS 51

34 C 4,617,760
95 GH 4,617,761
101 R 4,617,762
135 R 4,617,763
165.71 4,617,764
205 WG 4,617,765
209 R 4,617,766
298 4,618,349
358 4,617,767

CLASS 52

40 4,617,768
167 4,617,769
214 4,617,770
410 4,617,771
461 4,617,772
521 4,617,774
537 4,617,773
684 4,617,775
690 4,617,776
802 4,617,777

CLASS 53

391 4,617,778
433 4,617,779
466 4,617,780
477 4,617,781
479 4,617,782
529 4,617,783
540 4,617,784
562 4,617,785

CLASS 55

92 4,618,350
146 4,618,351
287 4,618,352
378 4,618,353

CLASS 56

13.4 4,617,786
14.6 4,617,787
295 4,617,788

CLASS 57

6 4,617,789
263 4,617,790
299 4,617,791
401 4,617,792

CLASS 60

39.79 4,617,796
274 4,617,794
276 4,617,795
285 4,617,793
444 4,617,797
450 4,617,798
602 4,617,799
689 4,617,800

CLASS 62

116 4,617,801
125 4,617,802
209 4,617,803
212 4,617,804
259.1 4,617,805
347 4,617,806
399 4,617,807
472 4,617,808

CLASS 65

2 4,618,354
36 4,618,355
173 4,618,356

CLASS 69

44 4,617,809

CLASS 70

14 4,617,810
131 4,617,811
218 4,617,812
394 4,617,813

CLASS 71

76 4,618,357
86 4,618,358
88 4,618,359
4,618,360
4,618,361
4,618,362
90 4,618,363
92 4,618,364
4,618,365
94 4,618,366
121 4,618,367

CLASS 72

8 4,617,814
39 4,617,815
104 4,617,816
364 4,617,817
379 4,617,818
407 4,617,819

CLASS 73

1 E 4,617,820
23 4,617,821
40.5 R 4,617,822
46 4,617,823
49.7 4,617,824
152 4,617,825
182 4,617,826
200 4,617,827
590 4,617,830
865.8 4,617,829
866 4,617,828

CLASS 74

10.33 4,617,831
87 4,617,832
110 4,617,833
523 4,617,834
677 4,617,835
682 4,617,836
785 4,617,837
798 4,617,838
801 4,617,839
865 4,617,840
869 4,617,841

CLASS 75

53 4,618,368

CLASS 81

3.09 4,617,842
57.11 4,617,843
436 4,617,844

CLASS 82

1 C 4,617,845
1.2 4,617,846
2.5 4,617,847
36 A 4,617,848

CLASS 83

18 4,617,849
324 4,617,850

CLASS 84

1.19 4,617,851

CLASS 89

36.13 4,617,852

CLASS 91

505 4,617,853
517 4,617,854

CLASS 92

5 R 4,617,855
71 4,617,856
88 4,617,857
98 D 4,617,858

CLASS 99

351 4,617,859
415 4,617,860
453 4,617,861

CLASS 100

53 4,617,862
194 4,617,863

CLASS 101

219 4,617,864
350 4,617,865

CLASS 102

262 4,617,866

CLASS 105

? 4,617,868
154 4,617,867

CLASS 106

95 4,618,369
111 4,618,370
263 4,618,371
273 R 4,618,372
4,618,373
288 B 4,618,374
304 4,618,375

CLASS 108

132 4,617,869

CLASS 110

323 4,617,870

CLASS 114

39 4,617,871

CLASS 118

19 4,617,872

CLASS 119

17 4,617,873
51.12 4,617,874
85 4,617,875
155 4,617,876

CLASS 122

4 D 4,617,877
422 4,617,878

CLASS 123

73 AD 4,617,879
90.16 4,617,880
90.27 4,617,881
90.31 4,617,882
90.44 4,617,883
192 B 4,617,885
192 R 4,617,884
223 4,617,886
279 4,617,887
307 4,617,888
339 4,617,889
4,617,890
344 4,617,891
352 4,617,892
361 4,617,893
372 4,617,894
425 4,617,895
432 4,617,896
4,617,897
460 4,617,898
487 4,617,899
489 4,617,900
4,617,901
501 4,617,902
4,617,903
525 4,617,904
614 4,617,905
617 4,617,906
647 4,617,907

CLASS 126

20 4,617,908
299 R 4,617,909
362 4,617,910
438 4,617,911

CLASS 128

1 B 4,617,912
1 R 4,617,913
4 4,617,914
4,617,915
20 4,617,916
62 R 4,617,917
66 4,617,918
78 4,617,919
80 C 4,617,920
89 R 4,617,921
92 YS 4,617,922
94 4,617,923
204.23 4,617,924
303 B 4,617,925
303.1 4,617,926
303.14 4,617,927
305 4,617,928
305.3 4,617,929
317 4,617,930
328 4,617,931
334 R 4,617,932
348.1 4,617,933
425 4,617,934
641 4,617,935
653 4,617,936
680 4,617,937
708 4,617,938
734 4,617,939
753 4,617,940
765 4,617,941

CLASS 130

27 R 4,617,942

CLASS 131

109.3 4,617,943
235.1 4,617,944
310 4,617,945
336 4,617,946

CLASS 132

1 R 4,617,947
88.5 4,617,948
4,617,949
91 4,617,950

CLASS 134

26 4,618,376

CLASS 135

66 4,617,951

CLASS 137

85 4,617,952
110 4,617,953
4,617,954
240 4,617,955
272 4,617,956
315 4,617,957
492.5 4,617,958
512.1 4,617,959
554 4,617,960
596.16 4,617,961
613 4,617,962
625.17 4,617,965
625.3 4,617,963
4,617,964
625.62 4,617,966
625.64 4,617,967
4,617,968
627.5 4,617,969
805 4,617,970

CLASS 139

370.2 4,617,971

CLASS 140

92.1 4,617,972

CLASS 141

2 4,617,973
239 4,617,974
311 R 4,617,975

CLASS 148

6.15 R 4,618,377
9.6 4,618,378
144 4,618,379
187 4,618,380
189 4,618,381
415 4,618,382

CLASS 152

209 R 4,617,976

CLASS 156

66 4,618,383
205 4,618,384
229 4,618,385
242 4,618,386
244.11 4,618,387
284 4,618,388
307.3 4,618,390
307.5 4,618,389
353 4,618,391
384 4,618,392
4,618,393
473 4,618,394
584 4,618,395
605 4,618,396
628 4,618,397
643 4,618,398

CLASS 159

6.2 4,618,399

CLASS 162

5 4,618,400
138 4,618,401
140 4,618,402

CLASS 164

30 4,617,977
37 4,617,978
97 4,617,979
430 4,617,980
453 4,617,981
463 4,617,982
4,617,983

CLASS 165

1 4,617,984
32 4,617,985
42 4,617,986
95 4,617,987
4,617,988
145 4,617,989
173 4,617,990

CLASS 166

53 4,617,991
95 4,617,992
250 4,617,993
4,617,994
272 4,617,995
273 4,617,996
299 4,617,997
345 4,617,998
372 4,617,999
373 4,618,000

CLASS 169

23 4,618,001
37 4,618,002

CLASS 172

15 Re.32,266
25 4,618,003
176 4,618,004
459 4,618,005
699 4,618,006

CLASS 174

52 FP 4,618,739
67 4,618,740
68 C 4,618,741

CLASS 175

19 4,618,007
53 Re.32,267
65 4,618,008
267 4,618,009
329 4,618,010

CLASS 177

1 4,618,011
25 4,618,012
4,618,013
210 FP 4,618,014

CLASS 179

2 A 4,618,742
16 AA 4,618,743

CLASS 180

9.21 4,618,015

53.6 4,618,016
133 4,618,017
142 4,618,018
219 4,618,019
229 4,618,020
248 4,618,021
249 4,618,022
312 4,618,023

CLASS 181

120 4,618,024
148 4,618,025

CLASS 182

4 4,618,026
35 4,618,027
92 4,618,028
116 4,618,029
121 4,618,030

CLASS 186

52 4,618,031
61 4,618,032

CLASS 188

20 4,618,033
73.36 4,618,034

CLASS 190

18 A 4,618,035

CLASS 192

0.044 4,618,041
4,618,042
0.052 4,618,043
0.09 4,618,040
3.29 4,618,038
3.3 4,618,036
4,618,037
4 B 4,618,039
54 4,618,044
58 B 4,618,045
67 P 4,618,046
89 B 4,618,047
106.2 4,618,048
107 M 4,618,049

CLASS 194

212 4,618,050

CLASS 196

139 4,618,051

CLASS 198

370 4,618,052
389 4,618,053
409 4,618,054
422 4,618,055
853 4,618,056
861.2 4,618,057

CLASS 200

5 A 4,618,744
50 C 4,618,745
61.45 R 4,618,746
67 PK 4,618,747
144 B 4,618,749
4,618,750
144 R 4,618,748
4,618,751
148 G 4,618,753
148 R 4,618,752
159 B 4,618,754
175 4,618,755

CLASS 204

98 4,618,403
128 4,618,404
129.75 4,618,405
181.1 4,618,406
206 4,618,407
299 R 4,618,408
300 R 4,618,409

CLASS 206

291 4,618,058
392 4,618,059
444 4,618,060
4,618,061
455 4,618,062

CLASS 208

48 AA 4,618,411
59 4,618,412
97 4,618,410
251 R 4,618,413

CLASS 209

5 4,618,414
134 4,618,415
166 4,618,416

CLASS 210

149 4,618,417
151 4,618,418
167 4,618,419
169 4,618,420
170 4,618,421
172 4,618,422
305 4,618,423
396 4,618,424
416.1 4,618,425
620 4,618,426
629 4,618,427
648 4,618,428
652 4,618,429
703 4,618,430
741 4,618,431
748 4,618,432

CLASS 211

184 4,618,063
192 4,618,064

CLASS 215

3 4,618,065
12 R 4,618,066

CLASS 219

10.55 R 4,618,756
60 R 4,618,757
121 LG 4,618,758
121 LR 4,618,759
130.4 4,618,760
517 4,618,761

CLASS 220

1.5 4,618,067
4 R 4,618,068
23.4 4,618,069
350 4,618,070
371 4,618,071

CLASS 221

2 4,618,072
11 4,618,073
15 4,618,074

CLASS 222

189 4,618,075
331 4,618,076
383 4,618,077
478 4,618,078
591 4,618,079

CLASS 223

95 4,618,080

CLASS 224

41 4,618,081
321 4,618,082
324 4,618,083

CLASS 225

96 4,618,084
100 4,618,085

CLASS 227

19 4,618,086
131 4,618,087

CLASS 228

124 4,618,088
212 4,618,089

CLASS 229

45 R 4,618,090

CLASS 236

12.12 4,618,091
92 B 4,618,092

CLASS 238

283 4,618,093

CLASS 239

90 4,618,095
101 4,618,096
124 4,618,097
265.37 4,618,094
290 4,618,098
332 4,618,099
440 4,618,100
589 4,618,101
737 4,618,102

CLASS 241

41 4,618,103

CLASS 242

18 G 4,618,104
56 R 4,618,105
84.21 R 4,618,107
84.5 R 4,618,106
107 4,618,108

CLASS 244

130 4,618,109
151 B 4,618,110
158 R 4,618,111
4,618,112

CLASS 248

56 4,618,113
65 4,618,114
174 4,618,115
222.1 4,618,116
4,618,117
243 4,618,118
456 4,618,119
460 4,618,120

CLASS 249

59 4,618,121
94 4,618,122

CLASS 250

201 4,618,762
211 R 4,618,763
227 4,618,764
269 4,618,765
311 4,618,766
4,618,767
334 4,618,768
338 4,618,769
4,618,770
343 4,618,771
363 S 4,618,772
4,618,773
364 4,618,774
369 4,618,775
372 4,618,776
381 4,618,777
483.1 4,618,778

CLASS 251

28 4,618,123

CLASS 252

8.51 4,618,434
8.514 4,618,433
8.551 4,618,435
32.5 4,618,437
47.5 4,618,438
4,618,439
48.2 4,618,440
49.5 4,618,441
70 4,618,442
92 4,618,443
4,618,444
99 4,618,445
135 4,618,446
139 4,618,447
180 4,618,448
182 4,618,449
325 4,618,436
355 4,618,450
373 4,618,451
408.1 4,618,452
500 4,618,453
4,618,454

CLASS 254

134.3 FT 4,618,124

CLASS 260

397.4 4,618,456
504 R 4,618,457
505 P 4,618,458
543 F 4,618,455
543 R 4,618,459
549 4,618,460

CLASS 261

130 4,618,462

CLASS 264

29.2 4,618,463
35 4,618,464
40.1 4,618,465
40.6 4,618,466
46.6 4,618,467
53 4,618,468
182 4,618,469

CLASS 266

90 4,618,125
271 4,618,126

CLASS 267

8 R 4,618,127
140.1 4,618,128
4,618,129
153 4,618,130

CLASS 269

32 4,618,131
323 4,618,133

CLASS 271

4 4,618,134
9 4,618,135
150 4,618,136
219 4,618,137
245 4,618,138

CLASS 272

70 4,618,139
72 4,618,140
73 4,618,141
75 4,618,142
123 4,618,143
134 4,618,144
146 4,618,145

CLASS 273

1 E 4,618,146
54 B 4,618,147
73 C 4,618,148
79 4,618,149
143 R 4,618,150
148 A 4,618,151

CLASS 277

53 4,618,152
152 4,618,153
205 4,618,154

CLASS 280

5.28 4,618,155
6 R 4,618,156
8 4,618,157
11.1 BR 4,618,158
93 4,618,159
281 LP 4,618,160
402 4,618,161
661 4,618,162
785 4,618,163
804 4,618,164
808 4,618,165

CLASS 281

15 R 4,618,166

CLASS 283

75 4,618,167

CLASS 285

21 4,618,168
86 4,618,169
90 4,618,170
93 4,618,171
141 4,618,172
261 4,618,173

CLASS 292

135 4,618,174
205 4,618,175
263 4,618,176
338 4,618,177

CLASS 294

64.1 4,618,178
82.31 4,618,179

CLASS 296

97 J 4,618,132
120 A 4,618,180
191 4,618,181
223 4,618,182

CLASS 297

2 4,618,183
19 4,618,184
285 4,618,185
468 4,618,186

CLASS 301

56 4,618,187

CLASS 303

116 4,618,188
4,618,189

CLASS 305

39 4,618,190

CLASS 307

60 4,618,779
130 4,618,780
252 C 4,618,781
255 4,618,782
426 4,618,783
449 4,618,784
530 4,618,785
578 4,618,786
591 4,618,787
603 4,618,788

CLASS 310

13 4,618,789
90 4,618,790
4,618,791
156 4,618,792
232 4,618,793
234 4,618,794
260 4,618,795
311 4,618,796
339 4,618,797
366 4,618,798

CLASS 312

201 4,618,191
245 4,618,192
264 4,618,193

CLASS 313

318 4,618,799
417 4,618,800
495 4,618,801
512 4,618,802

CLASS 315

241 R 4,618,803

CLASS 318

16 4,618,804
245 4,618,805
254 4,618,806
280 4,618,807
696 4,618,808
768 4,618,809
803 4,618,810

CLASS 322

28 4,618,811

CLASS 323

224 4,618,812
268 4,618,813
280 4,618,814
315 4,618,815
316 4,618,816
322 4,618,817

CLASS 324

62 4,618,818
77 K 4,618,819
158 F 4,618,820
158 P 4,618,821
207 4,618,822
4,618,823
208 4,618,824
230 4,618,825
308 4,618,826
309 4,618,827
347 4,618,828

CLASS 329

103 4,618,829
105 4,618,830

CLASS 330

124 R 4,618,831
254 4,618,832
256 4,618,833
284 4,618,834

CLASS 331

65 4,618,835
96 4,618,836
160 4,618,837

CLASS 333

33 4,618,838
81 A 4,618,839
105 4,618,840
195 4,618,841

CLASS 335

128 4,618,842
210 4,618,843

CLASS 338

2 4,618,844

CLASS 339

14 R 4,618,194
16 R 4,618,195
17 C 4,618,196
17 R 4,618,197
60 M 4,618,198
74 R 4,618,199
75 P 4,618,200
99 R 4,618,201
4,618,202
4,618,203
4,618,204
125 L 4,618,205
144 T 4,618,206
176 M 4,618,207
200 P 4,618,208
258 R 4,618,209

CLASS 340

61 4,618,845
347 AD 4,618,852
347 CC 4,618,848
4,618,850
347 DA 4,618,847
4,618,851
347 DD 4,618,846
4,618,849
505 4,618,853
567 4,618,854
605 4,618,855
626 4,618,856
654 4,618,857
724 4,618,858
4,618,859
825.44 4,618,860
825.54 4,618,861
870.37 4,618,862

CLASS 342

162 4,618,864
194 4,618,863

CLASS 343

776 4,618,865
779 4,618,866
781 P 4,618,867

CLASS 346

75 4,618,868
4,618,869
76 PH 4,618,870

CLASS 350

96.14 4,618,210
96.15 4,618,211
96.21 4,618,212
96.34 4,618,213
162.2 4,618,214
319 4,618,215
345 4,618,216
355 4,618,217
363 4,618,218
427 4,618,219
4,618,220
566 4,618,221
582 4,618,222
611 4,618,223
618 4,618,224

CLASS 351

57 4,618,225
113 4,618,226
161 4,618,227
4,618,228
4,618,229
221 4,618,230
237 4,618,231

CLASS 353

79 4,618,232

CLASS 354

20 4,618,233
225 4,618,234
403 4,618,235
406 4,618,236
412 4,618,237
431 4,618,238
477 4,618,239

CLASS 355

3 DD 4,618,241
3 FU 4,618,240
4,618,242
4 4,618,243
8 4,618,244
14 CH 4,618,249
14 FU 4,618,247
14 R 4,618,246
4,618,248
14 SH 4,618,245
15 4,618,250
28 4,618,251
55 4,618,252
57 4,618,253
68 4,618,254
71 4,618,255

CLASS 356

23 4,618,256
71 4,618,257
73.1 4,618,258
152 4,618,259
331 4,618,260
357 4,618,261
4,618,262

CLASS 357

15 4,618,871
23.4 4,618,872
23.7 4,618,873
30 4,618,874
46 4,618,875
54 4,618,876
56 4,618,877
71 4,618,878
74 4,618,879

CLASS 358

10 4,618,880
27 4,618,881
31 4,618,882
78 4,618,883
98 4,618,884
4,618,885
108 4,618,886
112 4,618,887
120 4,618,888
144 4,618,889
149 4,618,890
153 4,618,891
163 4,618,892
167 4,618,893
310 4,618,894
311 4,618,895

CLASS 360

1 4,618,896
15 4,618,897
51 4,618,898
73 4,618,899
97 4,618,900
114 4,618,901

118 4,618,902
132 4,618,903
4,618,904

CLASS 361

4 4,618,905
5 4,618,906
45 4,618,907
187 4,618,908
212 4,618,909
275 4,618,910
308 4,618,911
309 4,618,912
315 4,618,913
4,618,914
400 4,618,915
434 4,618,916

CLASS 362

88 4,618,917
281 4,618,918

CLASS 363

21 4,618,919
37 4,618,920
49 4,618,921
127 4,618,922
144 4,618,923

CLASS 364

191 4,618,924
200 4,618,925
4,618,926
410 4,618,927
414 4,618,928
415 4,618,929
426 4,618,930
431.02 4,618,931
478 4,618,932
481 4,618,933
507 4,618,934
510 4,618,935
513.5 4,618,936
518 4,618,937
552 4,618,938
555 4,618,939
560 4,618,940
724 4,618,941
900 4,618,942

CLASS 365

104 4,618,943
189 4,618,944
4,618,945
4,618,946
230 4,618,947

CLASS 366

127 4,618,263

CLASS 367

104 4,618,948
171 4,618,949

CLASS 368

74 4,618,264
82 4,618,265

CLASS 369

32 4,618,950
270 4,618,951

CLASS 370

78 4,618,952

CLASS 371

12 4,618,933
16 4,618,954
37 4,618,955
68 4,618,956

CLASS 372

22 4,618,957
29 4,618,958
46 4,618,959
58 4,618,960
87 4,618,961

CLASS 373

30 4,618,962
72 4,618,963
155 4,618,964

CLASS 374

41 4,618,266
50 4,618,267
115 4,618,268
208 4,618,274

CLASS 375

10 4,618,965
62 4,618,966
80 4,618,967

CLASS 376

123 4,618,470
228 4,618,471
446 4,618,472

CLASS 377

39 4,618,968
49 4,618,969

CLASS 378

10 4,618,970
34 4,618,971
4,618,972
40 4,618,974
51 4,618,975
99 4,618,976
037 4,618,973
139 4,618,977
164 4,618,978
176 4,618,979
206 4,618,980

CLASS 381

15 4,618,981
36 4,618,982
43 4,618,983
4,618,984
51 4,618,985
67 4,618,986
82 4,618,987

CLASS 382

5 4,618,988
25 4,618,989
43 4,618,990
46 4,618,991

CLASS 383

4 4,618,992
44 4,618,993
96 4,618,994

CLASS 384

95 4,618,269
114 4,618,270
461 4,618,271
517 4,618,272
606 4,618,273

CLASS 400

76 4,618,275
124 4,618,276
4,618,277
568 4,618,278

CLASS 401

36 4,618,279
107 4,618,280

CLASS 404

16 4,618,281

CLASS 405

53 4,618,282
124 4,618,283
129 4,618,284
150 4,618,298
191 4,618,285
208 4,618,286
232 4,618,287
4,618,288
236 4,618,289
259 4,618,290
261 4,618,291

CLASS 406

19 4,618,292
28 4,618,293
113 4,618,294
138 4,618,295

CLASS 407

42 4,618,296

CLASS 409

58 4,618,297

CLASS 411

374 4,618,299
433 4,618,300

CLASS 413

8 4,618,301

CLASS 414

33 4,618,302
226 4,618,303
306 4,618,304
403 4,618,305
420 4,618,306
498 4,618,307
532 4,618,308
753 4,618,309

CLASS 415

1 4,618,310
149 R 4,618,311

CLASS 416

119 4,618,312
237 4,618,313

CLASS 417

53 4,618,314
354 4,618,315
454 4,618,316

CLASS 418

6? 4,618,317
111 4,618,318
136 4,618,319

CLASS 419

11 4,618,473

CLASS 420

436 4,618,474

CLASS 422

56 4,618,475
100 4,618,476
186.29 4,618,477
198 4,618,478
202 4,618,479

CLASS 423

127 4,618,480
228 4,618,481
242 4,618,482
304 4,618,483

CLASS 424

1.1 4,618,484
4,618,485
11 4,618,486
15 4,618,487
49 4,618,488
52 4,618,489
80 4,618,490
81 4,618,491
85 4,618,492
89 4,618,493
101 4,618,494
195.1 4,618,495
4,618,496

CLASS 425

38 4,618,320
88 4,618,321
129 R 4,618,322

CLASS 426

233 4,618,497
275 4,618,498
283 4,618,499
433 4,618,500
534 4,618,501
583 4,618,502

CLASS 427

11 4,618,503
34 4,618,504
38 4,618,505
40 4,618,506
41 4,618,507
57 4,618,508
74 4,618,509
89 4,618,510
203 4,618,511
381 4,618,512
443.1 4,618,513

CLASS 428

1 4,618,514
35 4,618,515
4,618,516
36 4,618,517
40 4,618,518
63 4,618,519
131 4,618,520
137 4,618,521
145 4,618,522
189 4,618,523
198 4,618,524
209 4,618,525
4,618,526
213 4,618,527
216 4,618,528
224 4,618,529
236 4,618,530
283 4,618,531
304.4 4,618,532
315.7 4,618,533
316.6 4,618,534
325 4,618,535
329 4,618,536
336 4,618,537
428 4,618,538
470 4,618,539
552 4,618,540
688 4,618,541
694 4,618,542

CLASS 429

19 4,618,543
53 4,618,544
130 4,618,545
133 4,618,546
174 4,618,547
194 4,618,548
234 4,618,549

CLASS 430

11 4,618,550
58 4,618,551
60 4,618,552
69 4,618,553
78 4,618,554
4,618,555
110 4,618,556
114 4,618,557
115 4,618,558
127 4,618,559
130 4,618,560
156 4,618,561
157 4,618,562
219 4,618,563
270 4,618,564
271 4,618,565
4,618,566
311 4,618,567
417 4,618,568
428 4,618,569
505 4,618,570
4,618,571
543 4,618,572
558 4,618,573
567 4,618,574
634 4,618,575

CLASS 431

177 4,618,323

CLASS 433

19 4,618,324
26 4,618,325
79 4,618,326

CLASS 435

1 4,618,586
7 4,618,576
4,618,577
68 4,618,578
96 4,618,579
104 4,618,582
108 4,618,580
119 4,618,581
146 4,618,583
234 4,618,584
240 4,618,585

CLASS 436

74 4,618,587
511 4,618,588
540 4,618,589

CLASS 440

53 4,618,327

CLASS 441

57 4,618,328
76 4,618,329

CLASS 446

236 4,618,330

CLASS 455

2 4,618,995
46 4,618,996
76 4,618,997
77 4,618,998
108 4,618,999
131 4,619,000
192 4,619,001
226 4,619,002

CLASS 474

49 4,618,331
80 4,618,332
4,618,333
93 4,618,334
112 4,618,335
133 4,618,336
201 4,618,337
245 4,618,338

CLASS 493

4 4,618,339
13 4,618,340
14 4,618,341
30 4,618,342

CLASS 501

17 4,618,590
90 4,618,591
96 4,618,592

CLASS 502

20 4,618,593
66 4,618,594
108 4,618,595
116 4,618,596
324 4,618,597

CLASS 514

6 4,618,598
11 4,618,599
12 4,618,600
23 4,618,601
25 Re.32,268
54 4,618,602
80 4,618,603
130 4,618,604
177 4,618,605
202 4,618,606
212 4,618,607
235 4,618,608
236 4,618,609
242 4,618,610
255 4,618,611
265 4,618,612
312 4,618,613
321 4,618,614
338 4,618,615
340 4,618,616
364 4,618,617
368 4,618,618
383 4,618,619
4,618,620
408 4,618,621
457 4,618,622
478 4,618,623
486 4,618,624
494 4,618,625
530 4,618,626
678 4,618,627

CLASS 518

700 4,618,628

CLASS 521

76 4,618,629
105 4,618,630
109.1 4,618,631

CLASS 522

43 4,618,632

CLASS 524

80 4,618,633
97 4,618,634
113 4,618,635
176 4,618,636
192 4,618,637
208 4,618,638
262 4,618,639
272 4,618,640
284 4,618,641
425 4,618,642
430 4,618,643
535 4,618,644
745 4,618,645
783 4,618,646
801 4,618,647

CLASS 525

60 4,618,648
4,618,649
105 4,618,650
130 4,618,651
282 4,618,652
288 4,618,654
344 4,618,655
404 4,618,653
4,618,656
443 4,618,657
454 4,618,658
455 4,618,659

CLASS 526

114 4,618,660
4,618,661
129 4,618,662
232.3 4,618,663

CLASS 527

300 4,618,664

CLASS 528

25 4,618,665
33 4,618,666
49 4,618,667
215 4,618,668

CLASS 530

331 4,618,669
378 4,618,670

CLASS 534

635 4,618,671
658 4,618,672
698 4,618,673
878 4,618,674

CLASS 536

17.2 4,618,675

CLASS 544

196 4,618,676
400 4,618,677

CLASS 546

123 4,618,678
220 4,618,679
234 4,618,680
276 4,618,681

CLASS 548

315 4,618,682
420 4,618,683
455 4,618,684

CLASS 549

63 4,618,685
360 4,618,686
396 4,618,687

CLASS 556

419 4,618,688
425 4,618,689
441 4,618,690

CLASS 558

80 4,618,691
81 4,618,692
82 4,618,693
234 4,618,461
416 4,618,694

CLASS 560

41 4,618,695
53 4,618,696
56 4,618,697
67 4,618,700
86 4,618,699
060 4,618,698
139 4,618,701
204 4,618,702
209 4,618,703
262 4,618,704
263 4,618,705
335 4,618,706
337 4,618,707

CLASS 562

448 4,618,708
532 4,618,709

CLASS 564

1 4,618,710
86 4,618,711
103 4,618,712
214 4,618,713
329 4,618,714
414 4,618,715
469 4,618,716
475 4,618,717
481 4,618,718

CLASS 568

17 4,618,719
4,618,720
23 4,618,721
59 4,618,722
70 4,618,723
311 4,618,724
315 4,618,725
322 4,618,726
585 4,618,727
652 4,618,728
678 4,618,729
771 4,618,730
842 4,618,731
910.5 4,618,732
927 4,618,733

CLASS 570

136 4,618,734

CLASS 585

240 4,618,735
4,618,736
329 4,618,737
480 4,618,738

CLASS 604

29 4,618,343

CLASSIFICATION OF DESIGNS

D2—	209	286,220			286,244		367	286,264	D13—	19	286,280	D19—	3	286,300		97	286,321
	514	286,221		13	286,245			286,265		24	286,281		6	286,301		138.3	286,322
D3—	32	286,227			286,246		376	286,266	D14—	53	286,282		34.1	286,302		150	286,323
	35	286,228			286,247		435	286,267			286,283		99	286,303		151	286,324
	48	286,229			286,248		447	286,268			286,284	D20—	39	286,304	D24—	1.1	286,325
	71	286,230		23	286,249	D10—	31	286,269		60	286,285	D21—	25	286,305		28	286,326
	72	286,231		27	286,250		86	286,270		62	286,286		57	286,306	D28—	45	286,327
	104	286,315		77	286,251		102	286,271		68	286,287		114	286,307		49	286,328
D6—	384	286,232			286,252	D11—	93	286,272		91	286,288		146	286,308		73	286,329
	397	286,233		137	286,253		143	286,273		100	286,289		173	286,309			286,330
	404	286,234		317	286,254		232	286,223		104	286,290		175	286,310		78	286,331
	522	286,235		332	286,255			286,224		111	286,291		195	286,311	D29—	15	286,222
		286,236		334	286,256			286,225	D15—	9	286,292		198	286,312	D30—	13	286,332
	525	286,237		368	286,257			286,226		28	286,293		249	286,313		16	286,333
	573	286,238		379	286,258	D12—	146	286,274		132	286,294	D22—	118	286,314	D32—	22	286,334
	601	286,239	D8—	1	286,259		163	286,275	D16—	31	286,295		127	286,317			286,335
D7—	5	286,240		14	286,260			286,276		32	286,296		129	286,316		23	286,336
	11	286,241		354	286,261		196	286,277			286,297	D23—	18	286,318		47	286,337
		286,242	D9—	303	286,262		211	286,278		39	286,298		41	286,319	D34—	23	286,338
		286,243		322	286,263		313	286,279	D17—	20	286,299		88	286,320		43	286,339

CLASSIFICATION OF PLANTS

P.—	7	5,791		68	5,792		82	5,793									

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,618,081
4,618,125
4,618,215
4,618,290
4,618,691
4,618,755
02 : 4,618,015
04 : 4,617,684
4,617,691
4,617,741
4,617,754
4,617,801
4,618,029
4,618,470
05 : 4,618,003
06 : Re.32,267
4,617,697
4,617,702
4,617,711
4,617,716
4,617,726
4,617,743
4,617,763
4,617,775
4,617,789
4,617,796
4,617,842
4,617,844
4,617,861
4,617,875
4,617,921
4,517,947
4,617,930
4,617,960
4,617,964
4,617,973
4,618,004
4,618,008
4,618,061
4,618,066
4,618,068
4,618,069
4,618,073
4,618,075
4,618,077
4,618,100
4,618,111
4,618,148
4,618,152
4,618,158
4,618,174
4,618,178
4,618,196
4,618,213
4,618,217
4,618,222
4,618,223
4,618,224
4,618,262
4,618,281
4,618,283
4,618,285
4,618,323
4,618,372
4,618,373
4,618,419
4,618,420
4,618,444
4,618,485
4,618,487
4,618,500
4,618,502
4,618,510
4,618,541
4,618,577
4,618,578
4,618,600
4,618,652
4,618,696
4,618,710
4,618,734
4,618,738
4,618,754
4,618,763
4,618,771
4,618,786
4,618,797
4,618,799
4,618,800
4,618,810
4,618,816
4,618,833
4,618,840
4,618,845
4,618,892
4,618,898
4,618,917
4,618,918
4,618,938
4,618,956
4,618,961
4,618,965
4,618,970
4,618,992
4,619,000
08 : 4,617,909
4,617,927
4,617,991
4,618,026
4,618,058
4,618,133
4,618,301
4,618,480
4,618,779
4,618,835
09 : 4,617,784
4,617,953
4,617,984
4,618,082
4,618,086
4,618,144
4,618,147
4,618,256
4,618,264
4,618,365
4,618,423
4,618,484
4,618,516
4,618,548
4,618,677
4,618,719
4,618,720
4,618,727
4,618,813
4,618,935
4,618,953
10 : 4,617,781
4,618,435
4,618,509
4,618,702
4,618,731
4,618,937
12 : 4,617,687
4,617,693
4,617,725
4,617,772
4,617,808
4,617,886
4,617,932
4,618,063
4,618,227
4,618,229
4,618,266
4,618,271
4,618,348
4,618,442
4,618,443
4,618,517
4,618,688
4,618,743
4,618,795
4,618,821
4,618,908
13 : 4,617,862
4,617,936
4,617,951
4,618,057
4,618,212
4,618,225
4,618,289
15 : 4,618,166
4,618,497
16 : 4,617,942
4,618,744
17 : Re.32,268
4,617,708
4,617,709
4,617,733
4,617,774
4,617,778
4,617,802
4,617,813
4,617,832
4,617,865
4,617,868
4,617,908
4,617,933
4,617,958
4,618,028
4,618,065
4,618,083
4,618,101
4,618,113
4,618,131
4,618,143
4,618,149
4,618,160
4,618,175
4,618,190
4,618,205
4,618,207
4,618,232
4,618,267
4,618,306
4,618,307
4,618,359
4,618,388
4,618,518
4,618,544
4,618,579
4,618,594
4,618,657
4,618,683
4,618,775
4,618,777
4,618,787
4,618,836
4,618,886
4,618,915
4,618,941
4,618,973
4,618,981
4,619,002
18 : 4,617,705
4,617,822
4,617,972
4,618,078
4,618,098
4,618,103
4,618,257
4,618,475
4,618,478
4,618,680
4,618,856
19 : 4,617,797
4,617,956
4,618,426
4,618,584
4,618,751
20 : 4,617,786
4,617,859
4,618,304
21 : 4,618,263
4,618,681
4,618,826
22 : Re.32,266
4,617,823
4,618,010
4,618,154
4,618,288
4,618,412
4,618,430
4,618,512
4,618,857
24 : 4,617,923
4,617,940
4,618,005
4,618,410
4,618,434
4,618,576
4,618,629
4,618,850
4,618,864
25 : 4,617,694
4,617,719
4,617,722
4,617,745
4,617,913
4,617,963
4,618,118
4,618,214
4,618,258
4,618,261
4,618,284
4,618,305
4,618,322
4,618,346
4,618,399
4,618,401
4,618,492
4,618,533
4,618,685
4,618,802
4,618,803
4,618,863
4,618,865
4,618,925
4,618,960
4,618,978
26 : 4,617,742
4,617,752
4,617,835
4,617,849
4,617,855
4,617,966
4,617,968
4,618,034
4,618,056
4,618,095
4,618,114
4,618,120
4,618,124
4,618,159
4,618,180
4,618,186
4,618,192
4,618,193
4,618,265
4,618,268
4,618,294
4,618,296
4,618,329
4,618,375
4,618,456
4,618,461
4,618,473
4,618,505
4,618,511

4,618,621
4,618,642
4,618,645
4,618,665
4,618,817
27 : 4,617,706
4,617,713
4,617,747
4,617,758
4,617,826
4,617,916
4,617,919
4,618,139
4,618,162
4,618,195
4,618,318
4,618,520
4,618,525
4,618,586
4,618,649
4,618,740
4,618,897
4,618,922
4,618,943
4,618,971
28 : 4,618,060
4,618,367
29 : 4,617,975
4,618,295
4,618,334
4,618,357
4,618,604
4,618,679
4,618,713
4,618,733
4,618,895
30 : 4,617,753
31 : 4,618,006
4,618,102
4,618,909
32 : 4,617,750
4,618,369
4,618,839
33 : 4,618,515
4,618,904
34 : 4,617,686
4,617,696
4,617,731
4,617,732
4,617,738
4,617,762
4,617,872
4,617,877
4,617,918
4,618,030
4,618,112

4,618,177
4,618,194
4,618,203
4,618,211
4,618,310
4,618,345
4,618,355
4,618,408
4,618,413
4,618,432
4,618,436
4,618,437
4,618,481
4,618,490
4,618,494
4,618,498
4,618,504
4,618,514
4,618,528
4,618,530
4,618,562
4,618,565
4,618,583
4,618,597
4,618,624
4,618,647
4,618,705
4,618,728
4,618,737
4,618,745
4,618,849
4,618,867
4,618,876
4,618,880
4,618,882
4,618,972
4,618,975
35 : 4,617,820
4,618,378
4,618,452
36 : 4,617,685
4,617,730
4,617,735
4,617,816
4,617,856
4,617,873
4,617,934
4,618,121
4,618,138
4,618,198
4,618,206
4,618,241
4,618,243
4,618,248
4,618,249
4,618,274

4,618,279
4,618,291
4,618,292
4,618,299
4,618,325
4,618,383
4,618,421
4,618,428
4,618,431
4,618,440
4,618,447
4,618,476
4,618,477
4,618,489
4,618,501
4,618,522
4,618,527
4,618,551
4,618,560
4,618,574
4,618,638
4,618,644
4,618,686
4,618,689
4,618,718
4,618,767
4,618,773
4,618,784
4,618,808
4,618,819
4,618,827
4,618,861
4,618,872
4,618,889
4,618,896
4,618,907
4,618,916
4,618,924
4,618,957
4,618,962
4,618,984
4,618,986
4,618,988
4,618,995
37 : 4,617,770
4,617,788
4,617,884
4,617,946
4,618,059
4,618,170
4,618,598
4,618,603
4,618,674
4,618,806
4,618,996
39 : 4,617,710

4,617,767
4,617,771
4,617,817
4,617,838
4,617,847
4,617,935
4,617,981
4,617,992
4,618,032
4,618,141
4,618,171
4,618,231
4,618,320
4,618,344
4,618,389
4,618,390
4,618,450
4,618,503
4,618,513
4,618,519
4,618,539
4,618,546
4,618,650
4,618,667
4,618,684
4,618,707
4,618,723
4,618,756
4,618,769
4,618,792
4,618,920
4,618,929
4,618,966
40 : 4,617,917
4,617,999
4,618,000
4,618,009
4,618,024
4,618,025
4,618,197
4,618,314
4,618,352
4,618,433
4,618,595
4,618,722
4,618,939
41 : 4,618,287
4,618,324
42 : 4,617,692
4,617,712
4,617,765
4,617,815
4,618,001
4,618,055
4,618,067
4,618,119

4,618,142
4,618,201
4,618,370
4,618,374
4,618,387
4,618,438
4,618,441
4,618,448
4,618,464
4,618,472
4,618,507
4,618,567
4,618,632
4,618,648
4,618,655
4,618,659
4,618,678
4,618,682
4,618,703
4,618,711
4,618,716
4,618,729
4,618,770
4,618,815
4,618,824
4,618,906
44 : 4,618,002
45 : 4,618,076
4,618,910
47 : 4,617,860
4,617,922
4,617,989
4,618,161
4,618,403
4,618,483
4,618,739
4,618,791
4,618,848
48 : 4,617,736
4,617,744
4,617,807
4,617,825
4,617,828
4,617,937
4,617,993
4,617,994
4,617,995
4,617,996
4,617,997
4,617,998
4,618,051
4,618,115
4,618,173
4,618,199
4,618,269
4,618,270

4,618,308
4,618,312
4,618,316
4,618,353
4,618,400
4,618,411
4,618,465
4,618,526
4,618,585
4,618,596
4,618,630
4,618,658
4,618,660
4,618,661
4,618,717
4,618,765
4,618,785
4,618,832
4,618,852
4,618,855
4,618,931
4,618,946
4,618,947
4,618,968
49 : 4,618,341
4,618,919
50 : 4,617,689
4,618,822
4,618,911
51 : 4,617,690
4,617,749
4,617,811
4,618,157
4,618,167
4,618,380
4,618,415
4,618,453
53 : 4,618,109
4,618,155
4,618,218
4,618,429
4,618,479
4,618,949
54 : 4,617,746
4,618,221
4,618,635
55 : 4,617,892
4,618,116
4,618,151
4,618,191
4,618,384
4,618,980
4,618,990
56 : 4,617,876
4,618,276

DESIGN PATENTS

01 : 286,303
06 : 286,222
286,228
286,237
286,250
286,279
286,313
286,315
286,319
286,337
08 : 286,306
09 : 286,229
286,277
286,285

286,322
12 : 286,223
286,224
286,225
286,226
286,287
286,329
286,330
17 : 286,238
286,271
286,326
18 : 286,283
286,310
20 : 286,288

286,324
21 : 286,308
22 : 286,316
24 : 286,338
25 : 286,252
26 : 286,233
27 : 286,255
286,332
28 : 286,299
29 : 286,227
34 : 286,221
286,241
286,242

286,243
286,244
286,245
286,246
286,247
286,248
286,263
286,265
36 : 286,230
286,232
286,297
286,317
37 : 286,282

39 : 286,331
41 : 286,260
286,318
42 : 286,220
286,336
44 : 286,268
45 : 286,293
286,307
286,309
47 : 286,240
286,301
48 : 286,239
286,264

286,289
286,302
286,333
49 : 286,280
51 : 286,286
286,298
286,300
53 : 286,292
286,311
286,320
286,325
55 : 286,235
286,236

PLANT PATENTS

06 : 5,791
41 : 5,792

U.S. GOVERNMENT PRINTING OFFICE : O—1986

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ Domestic; @ $ Foreign.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

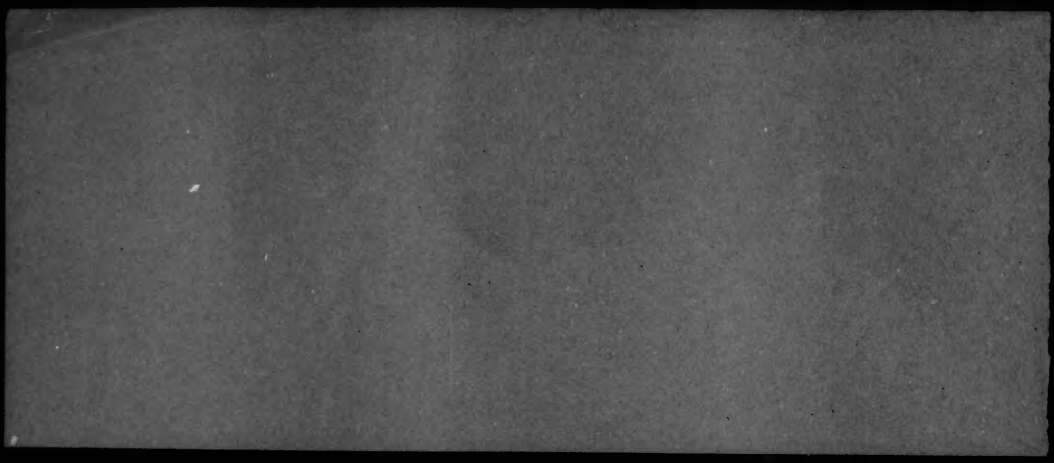
PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402



U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, *Secretary*
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, *Commissioner*